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NEWS IN BRIEF

CMC takeover takes off

CMC UK looks set to be owned by McDonnell Douglas within the next two weeks, now that the board of Microdata, CMC's US parent, has unanimously recommended that its shareholders accept the aerospace giant's cash offer (CW, July 19). The offer is \$32 for each of Microdata's 2.3 million shares, valuing Microdata at £73.6 million.

Industry sources indicate that McDonnell Douglas wants Microdata so that it can offer local processing facilities to the customers of its subsidiary, McAuta, one of the biggest service bureaux in the US.

\$1m loan

RASH has made a \$1 million three-year interest-free loan to the US firm, Digi-Log, whose Microterm II microcomputer system is now being sold in Europe by BASF as the System 7101 (CW, June 28). Another \$1 million is likely to be loaned next year and RASH has the option to convert the debt into 20% of Digi-Log stock.

Super profits

ANNOUNCING a net profit of nearly \$2.9 million and a turnover of more than \$12.4 million for the second quarter of 1979, Cray Research has attributed the profit to its sale of the Cray-1 supercomputer ordered by the UK Ministry of Defence last year (CW, April 28, 1978). First half turnover and net profit figures were \$24 million and \$3.7 million, respectively.

Computer census

DETAILED statistics on the numbers of computers installed in the UK, broken down by supplier and model, are contained in the 6th Annual Census of Computer Systems published by Polder Associates of Kingston, upon-Thames. The census, which costs £175, shows that the total installed base at the end of 1978 was 83,537 systems — 12,237 more than a year before.

'Settle 10-year-old IBM case,' says ex-law chief

GRIFFIN Bell, who retired as US Attorney General last week, in his farewell speech urged the US Justice Department to settle its 10-year anti-trust suit against IBM.

Bell, whose Atlanta law firm used to be retained by IBM, said that the duration of the IBM case suggested there might be something wrong with the US court system. Bell added that he would have tried to settle the case himself if he had not pledged at the confirmation hearings (when he became Attorney General) to stay out of the case because of his firm's prior involvement.

Bell's remarks about the IBM case were part of a wider attack on the Justice Department's anti-trust division in which he criticised the division's tendency to assume that competition was all that mattered.

Meanwhile, lawyers from the anti-trust division have responded to IBM's demand that the presiding judge in the case, David Edelstein, be replaced because of his alleged bias against IBM, a move which has halted the trial indefinitely (CW, July 20).

In a published memorandum they said that IBM's accusations (against Judge Edel-

stein) were not timely or sufficient and thus did not satisfy the statutory requirements for the withdrawal of the judge.

They pointed out that IBM complacently soldiered through three years of pre-trial proceedings and more than four years of trial before its alleged dissatisfaction with Judge Edelstein's rulings and comments precipitated second thoughts.

The government lawyers added that IBM had failed to demonstrate Judge Edelstein's stewardship of the case had been tainted by prejudice or bias.

Philips after 20% of Pertec

NEGOTIATIONS are under way between Pertec Computer Corp and the US arm of Philips which could lead to the Dutch giant taking a substantial minority stake in the Los Angeles-based peripherals and small systems company.

No figures have been revealed, but it is thought that Philips wants about 20% of the company, partly in new shares and partly by bidding for one already issued.

Last year Pertec took over management of Philips' US base of leased computers and also agreed to maintain Philips small business and office computers there (CW, November 28, 1978). Marketing continues to be handled by Philips.

Talks are also under way on Philips subsidiaries marketing the Pertec PCC-2000 microcomputer, made by the company's business systems division. South Africa is one of the countries where talks have taken place, but the marketing agreement is not yet concluded.

Otherwise Pertec and Philips have little business in common. Pertec has no peripherals suited to the small IBM-compatible computers built by Philips' Two PI company, nor does it buy components from Signetics, the semiconductor manufacturer in which Philips has a majority stake.

medium scale plug compatible computers even further. An IBM rental customer will qualify for a discount of up to 15% on a new model, presumably a 4301, bought between July 1981 and June 1982 if he purchases his 138 or 148 now and exchanges it during that period.



Ray Hazen lost his sight and a hand in a bomb explosion while in the Army in Northern Ireland, and is now on the staff of St Dunstan's. Here he demonstrates the control panel of the Kurzweil Reading Machine, having only had a few hours practice on it himself.

Intel takeover talks

● From front page

computer sales and financing business had a turnover of \$187.8 million on which it made a loss of \$75.1 million. In the first half of 1978 this business made a profit of \$15.2 million on turnover of \$135.8 million.

A group of Intel shareholders has launched a suit against the company and its officers alleging that they made false statements about the company's condition and prospects between January 8 and August 6 this year with a view to bolstering the share price.

One bright spot in Intel's gloom is the first two sales of the new AS/7-7033 dual processor system, one to Thyssen, the big West German steel company, and the other to Dallas County, Texas. Dallas County already has an AS/6.

● Meanwhile IBM in the US has made an offer to users of 370/138 and 148 machines which could adversely affect sales of

OCR spin-off from reader for the blind

AN OCR system capable of reading virtually any font of characters, either printed or typed, has been developed as one of the spin-offs of the invention of the Kurzweil Reading Machine for the Blind (CW, March 30, 1978).

Both the Reading Machine and the Kurzweil Data Entry Machine, as the OCR system is called, are being marketed in the UK by Turnkey Software of Amersham.

The first Reading Machine in the UK was installed last week at St Dunstan's in London, where a year-long evolution project is being carried out in co-operation with the Royal National Institute for the Blind.

Having only spent a few hours practising with the equipment, staff at St Dunstan's were already expressing enthusiasm for it. It is basically a sophisticated OCR device coupled to a speech synthesiser, capable of reading books aloud for blind people.

The Data Entry Machine uses the same scanning engine but produces digital text in ASCII or EBCDIC code, either on magnetic tape or along a communications link for entry into a computer.

The multi-font capability makes it of principal interest to those with special applications dealing with large quantities of text that is already in print, such as statutes, reports and contracts.

Word processing work in the legal field dealing with contracts is already being done this way in the US, and the Aetna Insurance Company has one machine on trial, for purposes which it is keeping secret.

The Data Entry Machine costs about \$80,000, consisting of the Kurzweil scanner, a Data General Nova 4 processor, a tape drive, a 10 Megabyte system disc and a Hewlett Packard graphics terminal. This item is used for displaying unrecognised characters such as ligatures, so that the operator can key in what they are.

The machine goes through a learning process with a font it has not seen before, taking some time over analysing each character topologically. When the features of the characters have been recorded in memory, reading goes considerably faster.

Average operating speed is 15 to 20 characters per second. An error rate of one substitution per 10,000 characters is claimed.

The Reading Machine now available is the Model 3, cheaper (\$20,000), smaller, faster (up to 300 words per minute), and with more features than its predecessors.

The reading unit is the size of a small desk top copier, and has a glass plate on which the book or paper to be read is placed.

There is a separate similar-sized box containing a processor purpose-designed out of MSI chips by Kurzweil staff themselves; no existing micro was fast enough. There is 64K 10-bit words of memory.

The learning feature, which is new, causes the reading accuracy to improve as scanning goes along with a new font.

Another new feature gives each sentence a crude "tune", with the stress going up and down on words according to part of speech and position.

NEB invests in US firm

● From front page.

QI produces two products, the main one being the QI Light. This is a multi-station, multi-function distributed processing system. Up to 32 workstations can be multiplexed together to form a network. Each workstation consists of a microcomputer, plasma display and keyboard, and can run up to four

floppy disc drives giving a storage capacity of 24 Mbytes. The second product is the Microlight, a self-contained workstation incorporating a plasma display, eight inch matrix printer, keyboard, two floppy disc drives and the microcomputer.

This can operate either as a stand-alone system, or be connected into the QI system.

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Briefing

CSA delegation for Japan

A MISSION from the Computing Services Association will visit Japan in November, to carry on discussions about possible co-operation over software, following the visit of a Japanese delegation here in June (CW, February 15).

No specific projects have yet been discussed, but the visit is seen to carry on.

Personal injunction

A TEMPORARY injunction has been granted to Trend Communications against Personal Computers, stopping the latter from selling the recently introduced Trendcom 100 computer under that name in this country. The printer is manufactured by Trendcom Inc. of Sunnyvale, California. The injunction, granted last week, runs for a fortnight until a full hearing of the case.

Times settlement

A SETTLEMENT at The Times, expected within four weeks, is said to proceed between management and the separate chief of the print union Naisip. Both sides describe themselves as optimistic. All Naisip's claims turned down the return-to-work formula but they are now working out a full operating agreement with management.

Month ahead

TALISMAN, the Stock Exchange computer based settlement system, appears to be operating so successfully that the proportion of bargains handled by it has been increased to 90% this week, one month ahead of schedule. It now processes 4,188 securities in 1,815 companies.

15% cut

EUROPEAN distributors of Intel products have been asked by the company to cut the cost of microprocessor development systems sold to the educational market by 15%.

NZ probe

RUNAWAY computing costs in the New Zealand government have led Prime Minister Robert Muldoon to appoint a special investigating committee. In a heated debate in Parliament, a finance minister admitted that many departments had been too eager to install machines without considering the management and support problems faced in a small country.

Micro takeover

THE UK subsidiary of US electronic component distributor Cramer Electronics has been purchased from the parent company for £250,000 by a group led by Dave Griffin, the UK subsidiary's managing director. The company is strong in the microprocessor market, having acquired Texas Instruments and Advanced Micro Devices among its franchisees.

Number 668

Thursday, August 30, 1979

Price 20p

Market ripe for UK office systems firms

PROGRESS in office systems development in the UK has been holding its own well against overseas competition, and opportunities for success for local manufacturers, if they press ahead, look very good now.

That is the conclusion of the CSA's project team, sponsored by the Department of Industry, that has just completed phase one of its study of office text processing (CW, March 1).

And Colin Lueson of Langton Information Systems, who is the project leader, is convinced that while US firms are making noises about their progress, they have not actually developed any working systems.

He feels there is still too much vague talk

about "potential," and where things might go, for designs to have developed any further. He points to the UK lead in word data as an example that could easily be followed by our systems suppliers.

The study, staffed from seven member consultancies of the CSA, aims to help the UK office systems industry by finding out in detail what the requirements for such systems are, and by promoting awareness of automation among potential users.

Phase One has produced a comprehensive report on existing technology, and a programme of work, studying the operations of ten organisations in detail to establish their needs for office systems.

Among the organisations that have agreed to be studied are BL Cars, Spillers food group, the Thames Water Authority and the British Institute of Management. There are also some finance and insurance companies and an engineering firm.

The project team in addition has designed a procedure for carrying out the studies, which it is felt will prove a very useful tool. Several of the Phase Two studies have already started.

Each study is costing about £20,000, half paid for by the DoI and half by the subject organisation, which is expected to benefit considerably from the information gathered over the five to six months involved.

Counter revolution in UK banks

EXPERIMENTS which could change the face of British banking are under way at the counters of all four of the major clearing banks. Barclays is planning an experiment using small counter terminals from Fortronic of Liff, but despite the high hopes of the four major

continental suppliers, Philips, Peugeot, and others are not the rest of the business has so far gone in the traditional UK bank suppliers, IBM and Burroughs.

Projects at Lloyds and the Midland have already progressed beyond the pilot stage. The Lloyds system began with an experiment in Brighton and proved so successful that it is being extended to many other branches in the south-east. It involves a small card-reader terminal with numeric keypad and strip display, called the IBM 5904, which was designed (as was the original IBM Cashpoint terminal) to Lloyds Bank's own

specifications. It is used in conjunction with the IBM 3604 terminal, which includes 480 character CRT and full keyboard.

The card reader is installed on the customer side of the counter and the VDU terminal on the cashier's side. When a customer wants to withdraw money, he notes his standard Cashpoint card, also used for operating Lloyds' automatic cash dispenser and transaction terminals, into the card reader and keys in his secret number. The bank counter clerk then checks on the VDU whether there are sufficient funds in the account, pays out the money and completes the transaction, thus automatically debiting the customer's account.

Lloyds has ordered 100 of the cashier terminals and 500 of the customer-operated card readers. The 100 cashier terminals will be installed in small branches

which do not do enough business to justify installation of an automatic cash dispenser. The small terminals cost only one-fifth as much as a cash dispenser, according to Lloyds. The through-the-wall IBM 3624 cash dispenser costs £15,500 and the lobby version costs £10,500.

The remaining 400 card reader terminals on order will be installed in local branches for use by customers rarely to check their account balances.

It is clear that subsequently the microprocessor-controlled terminals can be programmed for a wide variety of other transactions, but Lloyds is not ready to talk about its future plans.

The bank has also ordered a further 300 IBM 3624 automatic teller terminals to supplement the 200 already being installed. Midland Bank was the first to declare its intentions to go for

● Turn to back page.

Philips takes 45% of Pertec

AGREEMENT in principle has been reached between Philips and Pertec Computer Corp of Los Angeles under which Philips will acquire a stake of up to 45% in Pertec and agree not to increase its participation further for the next two years — unless another company tries to muscle in on the stock.

As expected (CW, August 23), Philips will seek to buy about two-thirds of the shares it wants in the market, at \$15 a time, and Pertec will make up the balance by selling Philips' undervalued stock of the same price.

Pertec has also agreed to issue further stock to Philips if the

tender offer does not bring in sufficient shares to make up the 45% wanted by Philips. The Dutch multinational, which is dealing through its allied company, North American Philips, will get three seats on the nine-member Pertec board.

In the year to March 1979, Pertec had record net profits of \$8.3 million on turnover of \$147.9 million.

Ownership of North American Philips is complex: about 62% of the shares are held by a Connecticut bank and trust company on behalf of US Philips Trust. The beneficiaries of the trust are the shareholders of the

parent company for Philips' Netherlands-based company. The remainder of the North American Philips shares are widely held.

All-party forum mooted

THE Conservative Computer Forum, the group aimed at keeping backbench MPs informed of issues and developments in the industry, is considering becoming all-party and developing into a pressure group along the lines of the US lobby organisations.

To decide this, a meeting is being held on September 20 at CAP House in London.

The forum so far has worked largely by holding informal

briefing sessions for MPs and peers, addressed by a range of well-known industry figures and consultants. The secretary, Philip Virgo, feels that to increase activities and impact, a more formal organisation is necessary.

At the latest meeting, many of the participants felt that the early crisis would require all our spare labour, while others thought the key was to re-educate Britain's attitude to marketing and competition.

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Worldwide trial for Prestel service

AS soon as the Prestel viewdata computer used for the market trial is released by the start-up of the London public service next month, the Post Office is to put the computer to good use in an international market trial.

An international Prestel service may never be a viable proposition, but the Post Office wants to waste no time in finding out. It is also keen to gain practical experience in resolving technical, social and legal problems sure to arise from international operation, according to Peter Benton, managing director of telecommunications.

The trial is expected to last one year during which a decision will be made on running a full scale service. Lough has been commissioned to help implement the trial, after running a six-month study which identified sufficient interest to justify it.

A major aim of the trial is to identify the kind of information globe-trotting business people and government officials need to find quickly and easily. Talks are under way with firms which might provide the relevant information, which may include world stock market prices, exchange rates, airline schedules and shipping news, and even company management information and economic analyses. One possible name for the trial service is Prestel International, and this and other details will be finalised as it starts up next month.

● More on Prestel in the UK — see page 5.

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THERE is no doubt that the
National Enterprise Board has
been doing its best to help the
UK computer industry.It supported ICL and Ferranti
through their lullaby days of the
early Seventies and has thus
helped produce two increasingly
successful companies.More recently it has moved
into the areas of software mar-
keting and office systems
through Inspec and Nexos, and
made a start at getting the UK
into the international
microelectronics business in a
big way through Immos.Whatever one thinks about
the progress and potential - or
otherwise - of Inspec, Nexos and
Immos, one has to admit that the
moves are bold and innovative,
especially for a government or-
ganisation. Government back-
ing tends to be associated with
research or keeping jobs going,
but the formation of Inspec has
shown that civil servants do,
after all, realise that products
have to be sold and that mar-
keting, too, costs a lot of money
and can need government funds.Inspec has also proved that
government backing does not
necessarily have to involve
government takeover. Member
companies have spoken very
highly of the way Inspec
operates.So far, then, the NEB has done
much to counter its image as a
lullaby for lullaby ducks. It has gotIs the NEB
on the
right track?on with the practicalities of
finding the best forms of support
for the UK computer industry
while others, notably the Na-
tional Economic Development
Council's working parties and
sub-committees, have talked
and produced less than startling
reports which have yet to be
acted on to any great degree by
government.In the last two months, how-
ever, the NEB has made some
puzzling moves which could
further alienate a government
which is not obviously keen on
public ownership of industry.First, the NEB decided to put
£5 million into a joint manufac-
turing company set up by UK
firm Data Recording Instru-
ment and Control Data's discmanufacturing subsidiary, Mag-
netic Peripherals (CW, July 5).
The deal faced such strong
opposition from the DRI
shareholder, Grundy, that the
NEB had to buy Grundy's 13%
holding for £1 million.The new manufacturing com-
pany will be 76% owned by DRI,
which in turn is 63% owned by
the NEB - and the NEB's hold-
ing is soon to increase to 87%.
Despite the NEB's large
minority holding in the new
company, Magnetic Peripherals
has made it clear that it expects
to have a high degree of control
over the joint operation.Existing Control Data disc
drives are to be the first products
made by the new company.
Magnetic Peripherals said itneeded extra manufacturing
capacity. The products will be
sold in Europe by Control Data
(1978 turnover \$2.70 million) in
competition with DRI's sub-
sidiary, Data Recording Equip-
ment (1978 turnover £16 mil-
lion).All that was in July. And now
the NEB is to spend £5 million on
setting up a joint venture with
another US company, QI Inc.,
August 20. This time there is
not even a UK firm involved.
The deal effectively creates a UK
outlet for QI and puts UK devel-
opment expertise at the US
firm's disposal. There are not
even any plans to link the joint
venture, which involves office
systems and other high-
technology products, with
Nexos, the NEB's office
automation venture with UK
companies.So in the last two months the
NEB has committed £13 million
of public money to helping a
large US corporation set up a
factory relatively cheaply to
make products to sell in Europe
in competition with a compa-
ratively small UK firm in which
the NEB is the major
shareholder, and to helping an-
other US company form a devel-
opment and marketing outlet in
the UK, where it will be com-
peting with UK companies.Both ventures will bring some
expertise to the UK. But the US
companies involved are going to
want a big say in how the UK
operations are run.The NEB has done a good job
in the past for the UK computer
industry but these latest moves
are questionable and could pro-
vide the Conservative govern-
ment with ammunition to kill off
the NEB.It would be a great pity for the
computer industry if the NEB's
keenness to get further into the
industry led to its downfall.Ten
years
ago...COMPUTER WEEKLY
AUGUST 28, 1969THE first GE-600 computer in
the UK was ordered by Ford for
its research and engineering
control at Dunton in
Essex. The machine, worth
about £750,000, was used for
designing an engineering work
and formed the basis of an in-
house time sharing network.
Clive Jenkins, (left) general
secretary of the White Collar
Union ASTMS, opened Dunlop
69 of the Manchester Free
Trade Hall with a speech ad-
vocating trade protection for the
UK industry.Get your
Stars ticketSPECTATORS have until Sep-
tember 10 to get their advance
tickets for the final of Com-
puters at Crystal Palace.Events have been finalised
the secondary competition
which will be called "The best
of the rest". Each team in this
final will have to do all three
events - a 100m dash, a 200m
dash and an obstacle relay race
- and the winner will be de-
cided from the teams with the
highest number of points over
all events.Tickets will be available on
the day, but will be more ex-
pensive. All advance ticket
holders are guaranteed seats in
the main stand. Tickets cost 50p
adults and 30p children under
14. Tickets should be payable
to Computasters, 117B High Street,
Croydon CR9 1UG. Please en-
close a stamped and addressed
envelope.

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More DP staff
join PO strikeDATA processing staff involved in the four-month-old Post Office pay dispute
look set to go it alone and continue with strike action even if 4,700 supervisory
colleagues decide to accept the latest offer. The dispute could eventually cost the
PO more than £100 million in lost revenue.In addition to 123 computer staff, members of the Society of Civil and Public
Servants, that have played the key role in blocking about £1,000 million in
telephone billing revenue, another 10 programmers and systems analysts have
been brought out on strike.While the official balloting of the 1,300 computer and 4,700 supervisory SCPS
members continues, union representatives of computer centres and project
teams voted by 17 to 4 last week to reject the offer, which would extend a 7%
grade restructuring payment to all instead of a restricted number of grades.An alternative offer of 5% if
restructuring did not take place,
was also rejected.Engineers from the white-
collar union ASTMS and the
Post Office Engineering Union
have refused to cross picket
lines at computer centres
affected by the strike, and this
has led to increasing hardware
problems.There was an attempt to use
the billing system at Leeds to
run some payroll applications,"
said an SCPS spokesman, "but
as has happened any tape decks at
present the system is not work-
ing properly. The IBM time
sharing system at Harpenden
works, which normally runs jobs
for up to 200 users is only coping
with about 45 users as the data-
plex devices there are down too."The spokesman also said that
the air cargo system, Laces, has
only one line printer out of four
working, and one card reader is
the main input method being
used."Not only will this dispute
affect the Post Office's opera-
tions for some considerabletime," he said, "but it has
already had a disastrous impact
on the staff. There has certainly
been a run on resignation forms
in recent months."Negotiations are believed to
be under way between the
CPSA, which represents 36,000
clerical workers, on the clearing
of the backlog for a lump sum
payment.NCR strike
goes onTHE month-old strike at NCR's
Dundee plant (CW, August 23) is
to continue after talks between
union representatives and
management on possible
improvements in the company's
pension scheme failed last week.Over 800 staff are now de-
manding that NCR's corporate
(US) personnel management be
involved once again in the dis-
cussions. They have already
participated twice in the discus-
sions.TUC's three rules
for new technologyWHILE new technology will
offer greatly increased oppor-
tunities for the UK to achieve
industrial and social success in
the 1980s, one of the most
important elements will be a
positive trade union response to
the challenges that emerge.In a report on employment
and technology, the TUC has
crystallised the views put for-
ward by its general secretary
Len Murray at a conference in
London earlier this year (CW,
June 7).During that conference he
stated: "Government action by
itself will not be enough... the
trade union movement must de-
velop its structures, policies and
capabilities to meet these
changing demands."It is a stance which has led the
report's authors to define three
conditions for success.These are:
1. A continuing commitment
to the work of the industrial
strategy, including theelimination of printers and
paper in data and word proce-
ssing will cover most of the cost
of realising the electronic office
concept where most workers are
equipped with their own ter-
minals.One effect of this revolution,
according to the report, will be a
decline in the importance of the
large central mainframes and,
hence, of network architectures,
like SNA that espouse a large
host processor.Impact of interconnected elec-
tronic offices, 1980 Strategic Busi-
ness Services, Suite 215, 4320
Stevens Creek Boulevard, San Jose,
California, 95129, US.Itel
founder
resignsFOUNDER, president and chief
executive of Itel, Peter Redfield,
has been replaced by Thomas
Tan, who becomes president and
chief operating officer. A new
chief executive is being sought.
Itel's 1979 half-year figures
show that of June 30 the company
had inventories valued at a
total of \$185.3 million, more than
double last year's figure of \$78.6
million. Reliable sources indicate
that apart from one Buell
747, valued at perhaps \$50 mil-
lion, these consist almost en-
tirely of unsold computers, most
of them smaller AS series
machines from National
Semiconductor.Discussions are under way
between Itel and National
Semiconductor which could lead
to the latter taking over Itel's
plug-compatible computer bus-
iness (CW, August 23).
Following agreement in prin-
ciple to sell three service divi-
sions to Computer Science Corp
for \$18 million, Itel is to sell a
fourth to Xerox for \$22 million.
It is the Autex Service Corp. of
Wellesley, Massachusetts.

Welsh first for 1-Mbit bubble

ONE of the first UK users of the
1 Megabit bubble memory de-
vice introduced earlier this year
by Intel (CW, March 8) looks
like being GR Electronics of
Newport, Gwent, which has just
launched a compact bubble
memory system for use where
electromechanical storage might
not be sufficiently reliable.Called the GR 7000, the sys-
tem now available comes with
up to four 92K bit Texas Instru-ments bubble devices providing
a maximum capacity of 40K
bytes. But GR recognises the
need for greater capacity and,
for that reason, is "very inter-
ested" in the Intel device.The TI device employed at the
moment is the same as that in-
corporated in TI's own Model
786 portable terminal which is
already being used by news-
paper reporters (CW,
November 23, 1978).Help in finding one's way
through the Edinburgh Festival
programmes is being provided to
visitors by ICL, which has set up
an information office with a
System Tan and online ter-
minals in Princess Street Gar-
den. Visitors can get pro-
gramme details either from a
VDU or as hard copy for taking
away, all free. Our picture
shows Festival director John
Drummond (centre) inaugu-
rating the system, with John
Robertson, manager of ICL
Scotland, and girls from his
head office who are manning
the service.

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1984 and all that...

THIS WEEK'S example of the strange things people say in the media
about computers was sent in by J. C. Smeathers, of Chichester, who
wins £5.Why aren't all The Kinks' discs still in the catalogue? The answer to this is
that companies are often run by accountants and other folk who have no
love of music or by computers who can more readily be forgiven their
sins.

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BEDFORDA mini computer system is required by AEC Division of Aerodynamics
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Applications for Operational Requirements quoting CEH/45 should be made to

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Dr. Christopher Evans

This revolution will be unstoppable

A universe of possibilities has been opened up to society following the Big Bang of the micro.

Directly or indirectly, its effects will be felt; but whether we will accept the challenge in an intelligent, reasoned way or shuffle uncomprehendingly into the future is some-

thing only future history itself can tell.

In his new book, *The Mighty Micro*, Dr. Christopher Evans has done much to modify the Machievellian aura generally attributed to computers and has closely examined each

layer of the futuro bo it social, economic or political.

In this interview/book review ROBIN WEBSTER takes a look at some areas that Evans believes are the most controversial and which will have the most far-reaching impact on every individual.

IF the computers of yesterday were a Goliath, their David of today is the micro. The micro is destined to benefit every individual but, in order to reap the benefits, society will undergo traumatic changes.

Some of these changes will inevitably occur in Man's own concept of himself; and the advent of intellectual activity in machines will have far-reaching resonance. It will be necessary for psychologists to re-examine human intelligence and re-define our concepts of thinking, learning and perception.

In his book *The Mighty Micro*, Dr. Christopher Evans, computer scientist and psychologist, has put forward the notion of a three-stage revolution which he says has already begun.

Stage One (1975-1982) is the dawn of public awareness in terms of computers, the stage of gimmicks and toys which is already evident.

Stage Two (1983-1990) will be when we see the first large-scale changes in the patterns of work and education, economics and social life.

Stage Three (1991-2000) will be signalled by political upheavals, and the vastly important emergence of the ultra-intelligent machine.

"As with the Industrial Revolution it (the Computer Revolution) will have an overwhelming and comprehensive impact, affecting every human being on earth in every respect of his or her life," writes Dr. Evans.

"Again, paralleling its predecessor, it will run at a gallop, though its time course will be shorter and its force may well be spent, not in 150 years, but in 25."

"Thirdly — again note the parallel — once the Revolution is under way it will be unstoppable... but there is an essential point of difference: whereas the Victorian machine age began, surged into motion and, indeed, almost ran its course before most people were aware of what had happened, we of the

closing years of the 1970s have the gift of foresight, the ability to contemplate — if not far long — the amazing change that man is about to force upon himself."

With this foresight then, we can ask: what will the effect of computers on the human potential be? Will reliance on such machines degrade us in some way or work to our advantage?

When I posed this question to Dr. Evans he stated: "It might well be that the human mind will develop far more rapidly in communication with elaborate media devices supplemented by computer power than in any discourse with other human beings."

"Since there is no alternative, anyway, there is little point in discussing the matter. People are going to be more at home with the computer even though many still view them as alien things."

"Unintentional organisms that restrict the randomness of human nature" is indeed how many people would describe computers, but Dr. Evans, like others, feels that greater expression rather than restriction will be made possible.

Moreover, he predicts that the introduction of certain devices in the early 1980s will lead, by the end of that decade, to the death of the printed word.

"The fact that we like the feel of paper and the feel of a well-bound book on a shelf will have to change no matter how reasonable such prejudices are," he said.

Filling in the detail in his book he writes: "The read-out terminals of the late 80s will be about the size of the average book today, and of course, you will only need one of them."

"The screens on which the text is displayed will vary in size depending upon what one wants — page-size for the hand-held book, wrist-size for quick reference and portability, a ceiling projection for reading in bed in absolute comfort — at last!"

"So far we have been talking about the book as an entertainer or infanter and, to this extent, the 'books' of the 1980s and beyond are not really different in principle from today's."

"But in one respect they do differ, and it is here that the electronic book revolution will have its greatest impact."

By this Dr. Evans means that, while the printed book is merely a passive device that transfers information from the mind of one individual (the author) to that of another (the reader), the 1980s computer equivalent will do far more.

"It will be a sifter and interpreter as well as a purveyor of information. Dictionaries, to give the most simple example, will offer packages of relevant information on command."

"You type in a word or a phrase describing the problem area and the computer will respond, probably with one or two questions probing the nature of your interest, and finally by generating a balanced summary with appropriate background information."

Encyclopaedias will be smart too, says Dr. Evans, and capable

of doing their own research. But there are problems to surmount; for, if a book is required to "know" its contents, it must have some technique of linking concepts.

"Scanning and classification is quite easily performed by human beings, but is simply too much for computers with their present, rather feeble intelligence," writes Dr. Evans.

"Nor is it a trivial problem to equip computers with the kind of programs which would allow

intelligence Quotient scale so the human mind does not average out at an IQ of 100, but 1,000,000.

At the bottom we have the decidedly unintelligent "species", rock, and just above that at an IQ of 10 we might have the amoeba. Fish cover the 50,000 to 100,000 range.

That gives us an indication of how far ahead we are of the lower orders of life.

Even placing the first generation of UIM at Man's average IQ level may not seem terribly

ant solution which, while not entirely free from flaws, is nevertheless the best that has yet been put forward.

"The key to it all, he pointed out, is to ask what the signs and signals are that humans give out, from which we infer that they are thinking?"

"It is clearly what kind of conversation we can have with them, and has nothing to do with what kind of face they have and what kind of clothes they wear..."

Instead, "Put a human — the judge or tester — in a room where there are two computer terminals, one connected to a computer, the other to a person."

"The judge, of course, does not know which terminal is connected to which, but can type into either terminal and receive typed messages back on them."

"Now the judge's job is to decide, by carrying out conversations with the entities on the end of the respective terminals, which is which."

"If the computer is very stupid, it will immediately be revealed and the human will have no difficulty identifying it."

"If it is bright, he may find that he can carry on quite a good conversation with it, though he may ultimately spot that it must be the computer."

"If it is exceptionally bright and has a wide range of knowledge, he may find it impossible to say whether it is the computer he is talking to or the person."

"In this case," Turing argues, "the computer will have passed the test and could for all practical purposes be said to be an intelligent machine."

Turing's test is designed to eliminate preconceptions concerning human versus machine intelligence, as do the following factors devised by Evans. They deal with the components involved.

"Data capture ability: an entity is intelligent to the extent that it can extract information from the universe around it. All other things being equal, the better its data capture (sensory) abilities, the more intelligent it is."

Here Dr. Evans believes that Man is far ahead of the computer, particularly with regard to the classic anthropomorphic robot.

Artificial sensors are still nowhere near the efficiency range needed, and it would require impractical amounts of computing capability just to handle the control of body motor mechanisms such as balance and walking.

"Data storage ability: an entity is intelligent to the extent that it can store information once captured, which can be referred to on future occasions to improve its ability to adjust."

In terms of RAM-type storage, if that indeed is what the brain is mostly composed of, Dr. Evans feels that humans are just ahead of computers — maybe just by two or three years.

"Processing speed: an entity's intelligence is partly a function of the speed with which its brain/computer can process information. This refers to the

switching speed of its basic units which in the case of most animals are neurones, and in computers, are micro-transistors. Without doubt computers are far superior in this domain and are getting more so all the time.

"Software flexibility: an entity is intelligent to the extent that its software is rapidly and easily modifiable. This may be one of the most important factors."

Evans added in the interview that it was the ability of an entity to update its own software that mattered, not how easy it was for anyone else to do it. At present, humans excel at this.

"Software efficiency: the way in which the system's software has been written will affect the entity's capacity to adjust to novel happenings in its environment. The more efficient the software (the quicker it runs, the less prone to errors or breakdowns, the less 'program space' it occupies) the more intelligent the entity."

Efficiency is still better in humans because "evaluation knows how to program very well as it has had a long time to do it in," said Dr. Evans.

"Software range: the bigger and wider the range of programs with which a system is equipped and with which its central processor can cope, the more intelligent is the creature."

In Dr. Evans' words, "this is one of the most striking differences between man and machine, we really whip them here."

Although Dr. Evans clearly believes in the coming of the UIM, there are powerful lobby and whole schools of thought objecting to its possible development.

The theoretical objection to the desirability of UIMs in everyday life is their insensitivity (being unfettered by human emotions) and lack of creativity.

Dr. Evans reminds us, however, of the completely novel computer proof of a Euclidean theorem (that the base angles of an isosceles triangle are equal), when the system simply flipped switch through 180 degrees and declared them to be congruent.

Dr. Evans believes that the only limits to growth are the limits of man himself, and that the gap where humans seek answers through "Cults of unreason" there "remains the real chance that the computer will be seen as a deity and if they evolve into UIMs, there will be an element of truth in the belief."

Nevertheless, it is hard not to be impressed by this characteristically statement by Evans in his book: "Lastly, the problem of machine intelligence is one of such intrinsic interest not only to mathematicians, computer scientists, engineers, programmers and psychologists, but to all humans, that the goal of creating an ultra-intelligent machine will prove too tempting to be ignored."

"Even if governments do not build commercial pressure and not build up, human beings — insatiably curious creatures that they are — would work on independently to achieve this visionary goal."

REFERENCES: 1. *The Mighty Micro*, by Dr. Christopher Evans, £3.50, 250pp. Published by Victor Gollancz, 14 Henrietta Street, London WC2.

2. *Culture of the Future*, by Dr. Christopher Evans, 250pp, published by Victor Gollancz, 14 Henrietta Street, London WC2.

3. *Processing speed: an entity's intelligence is partly a function of the speed with which its brain/computer can process information. This refers to the*

SOFTWARE FILE

Datamanager gets user-defined syntax

A WHOLE new range of applications will fall naturally within the scope of MSP's data dictionary Datamanager with the release of the next version of the software, 2.1.2, in November.

Crucial to the new possibilities is a facility which MSP calls user-defined syntax. This will allow the dictionary to be configured to model almost any complex system of dependencies whether related to DP or not.

At the moment, Datamanager is specifically oriented to the documentation of DP systems. Its basic entities include for example the concepts of system, program, module, database, file, group and record.

The system provides a simple language allowing the user to set up, and inquire on complex patterns of inter-entity relationships. Typical "joins" possible include "contains", "uses", "refers to", "calls", "inputs", and "outputs".

Given this data structuring capability, it has been clear for some time that the dictionary in effect constitutes an end-user database management system, suitable for storing, manipulating and retrieving a great variety of information, either online or in batch mode.

In fact, some users have already applied it outside the area of DP systems. One, for example, constructed a database documenting a complex set of manuals and another used it to build cross-referenced data on about 1,700 oil wells.

However, its application in such fields has been hindered somewhat by its predefined terminology. This might, for instance, have required a user to remember that a "system" was actually an allfield, while a "file" was a well.

This is the main problem which will be eliminated with the introduction of user-defined syntax.

User-defined syntax will consist initially of two facilities: member type — synonyms, allowing the user to specify his own names for Datamanager entities, and the facility to restrict the range of valid relationships.

The latter facility is important to maintain the intelligibility and consistency of the database. While it would be possible for a program either to "call" or "contain" a module, it would make no sense for a department to "call" an employee in a personnel database.

Normally, allocated space is not freed until all Sysout output has been printed. Where, for example, output is created for two destinations, the total space is reserved until both users have printed.

The dynamic Sysout datasets set up by Phosor are, by contrast, treated by VSI as independent jobs, so that space is released as soon as each dataset is printed.

In the case of long-running application programs, it allows

exception reports to be released as soon as they are available, they may then be examined while the application is running.

The package can also help to improve speed of efficiency, by allowing spool space to be freed earlier.

Supported under VSI release 6.0 and above, Phosor allows Sysout datasets to be allocated and released for early printing. Sysout is the logical device by which printer output is signalled.

It is particularly relevant to long-running tasks such as "TP" monitors, which need not be terminated to print status reports or dumps.

In the case of long-running application programs, it allows

DETAILS have come to light of a software package designed to analyse and report on the operational statistics generated by CMC key-to-disc equipment.

Called Midap — Management Information on Data Preparation — the package takes as its input the OAMT records generated by CMC equipment, together with fixed information on the data preparation department and its workload.

Among outputs which can be produced are reports on individual operator activity by workstation, and on group activity, by data entry format.

The package can also produce ranked operator performance lists, workload forecasts, and "effectiveness" reports — all of which may help to identify the need for corrective action such as more training, closer supervision, or more frequent equipment maintenance.

John Davey, who wrote the package, argues that Midap overcomes the limitations of the equivalent CMC package Oara,

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This is the main problem which will be eliminated with the introduction of user-defined syntax.

User-defined syntax will consist initially of two facilities: member type — synonyms, allowing the user to specify his own names for Datamanager entities, and the facility to restrict the range of valid relationships.

The latter facility is important to maintain the intelligibility and consistency of the database. While it would be possible for a program either to "call" or "contain" a module, it would make no sense for a department to "call" an employee in a personnel database.

Normally, allocated space is not freed until all Sysout output has been printed. Where, for example, output is created for two destinations, the total space is reserved until both users have printed.

The dynamic Sysout datasets set up by Phosor are, by contrast, treated by VSI as independent jobs, so that space is released as soon as each dataset is printed.

In the case of long-running application programs, it allows

exception reports to be released as soon as they are available, they may then be examined while the application is running.

The package can also help to improve speed of efficiency, by allowing spool space to be freed earlier.

Supported under VSI release 6.0 and above, Phosor allows Sysout datasets to be allocated and released for early printing. Sysout is the logical device by which printer output is signalled.

It is particularly relevant to long-running tasks such as "TP" monitors, which need not be terminated to print status reports or dumps.

In the case of long-running application programs, it allows

DETAILS have come to light of a software package designed to analyse and report on the operational statistics generated by CMC key-to-disc equipment.

Called Midap — Management Information on Data Preparation — the package takes as its input the OAMT records generated by CMC equipment, together with fixed information on the data preparation department and its workload.

Among outputs which can be produced are reports on individual operator activity by workstation, and on group activity, by data entry format.

The package can also produce ranked operator performance lists, workload forecasts, and "effectiveness" reports — all of which may help to identify the need for corrective action such as more training, closer supervision, or more frequent equipment maintenance.

John Davey, who wrote the package, argues that Midap overcomes the limitations of the equivalent CMC package Oara,

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Normally

OP SPOT

By Bernard Allen

How Tesco achieved a smooth switch-over to 3032 operations

TAKING hardware and many other factors into consideration, Tesco's site at Cheshunt, Herts, is quite an impressive set-up. It's the home of a six-Megabyte IBM 3032 — the first system of that type to be installed in the UK.

Supporting the machine is a mass storage system which holds an almost ridiculously large amount of data, and two laser printers which produce output about 10 times as fast as the conventional kind.

And when I visited the installation it was in the process of converting its applications to run on the IBM kit, and phasing out three ICL 1904S systems, as operations planning manager Dave Sinclair explained.

"We have just transferred one of our largest systems across, and will soon do likewise with two more. These other two use about 350 EDS 80 disc packs, and this number corresponds with the amount of work they represent to the site."

According to Sinclair, the systems are "very historically based" and therefore ideal for storing on the site's 3850 mass storage system.

"With these particular applications, we keep a lot of infor-



TWO operators looking suitably attentive at the master console. But what's that over there, on the far wall? It's a mural of the New York skyline. Operations planning manager Dave Sinclair spotted

one similar to it when on a visit to his local paint and wallpaper shop. He took a catalogue into work and showed it to the operations staff, who chose the one shown in the picture. All very democratic.

mation for about three years. The mass storage system is ideal for that purpose. You just put the data on the system and forget about it — that's the beauty of it."

Sinclair continued to speak of the IBM hardware in glowing terms. He was, however, rather less enthusiastic about the operator training courses IBM provides.

"Frankly, they don't seem to do much for the operator who has little or no experience of IBM systems. We used some of their courses, but more often than not they just weren't what we wanted for our operators."

To overcome this, Tesco took some of the operators off shift and gave them an intensive training by means of audio-

visual courses, in-house presentations and practical hands-on machine work.

"We knew that the machine was to be commissioned last July/August. So three months before that, we chose our first IBM shift and put them on days only."

"We used audio-visual courses and ran a number of in-house presentations. I gave one on the 3850 laser printer and Bob York, a shift manager, gave one on the 3850 mass storage system. Then the operators

worked on the machine to consolidate their knowledge."

They repeated the process with a further five operators and "bolstered up the ICL side" by engaging "lots" of contract operators.

In addition to listening patiently to all my questions, Dave Sinclair took me on a guided tour of the installation.

I asked to meet one of the operators and was introduced to Dave Gilpin, a "local lad" who has been at the site for about two years.

Gilpin was one of the first batch of operators to move on to the IBM 3032, and so I asked him to compare that system with the site's ICL 1904S systems.

Welcoming the ICL George 2 operating system against IBM's MVS and JES2 spooling system, he said:

"With George 2, it depends on how good the operator is. In the ICL systems we used to do a lot of our own scheduling in order to make the most of the resources available."

"Under MVS there is no problem with storage and the like. Each job has all the store it needs, which makes things much easier for the operator."

He also pointed out that with JES2 the operator is able to hold work on the system input and output queues. This is not possible under the George 2 operating system.

"But George 2 does allow you to stop a job in mid-flight and JES2 doesn't," he added.

According to Gilpin, the IBM 3032 gets through more testing work in a single day than the ICL 1904S systems manage in a week.

"The 1904S systems are hatch-oriented at our site, which means that there is a considerable administrative overhead."

"The programmers use TSO to submit a lot of their work to the IBM machine. They usually get two or three shots in per day."

"We find that the programmers submit work heavily just before lunchtime and at the end of the day. This means that they have listings waiting for them straight after lunch and first thing in the morning."



Bob York

Processor in its own right

WHEN Tesco decided to go to IBM kit, shift manager Bob York became involved in a way which was far from the usual smooth installation of the 3032 mass storage system.

"Put crudely, it's an automatic tape library," he said. "The IBM doesn't like to hear it being described in that manner. He's a bit of a ditherer."

Nevertheless, that description sums up the role played by the mass storage system. It can be used as a backup for data on tape or disc, or as a library, and placing it in the appropriate device.

In response to enquiries, datasets are "staged" on permanently-mounted 225 disc packs and from there can be accessed by active jobs.

The mass storage system holds 1,000 cartridges, each of which is equal to an IBM 3032 disc pack, which stores up to 10 Megabytes of data.

Said York, "The mass storage system holds about 90 per cent of our datasets, excluding the ten datasets that, at the moment, are half full at the moment."

According to Bob York, the mass storage system is a "mini-processor" in its own right, storing it up presents no problems for the operator.

He said, "It is loaded as a part of the system start-up procedure. All the operator has to do is start up a trace procedure for York is also responsible for training the operators in the use of the system."

Printer with all mod cons

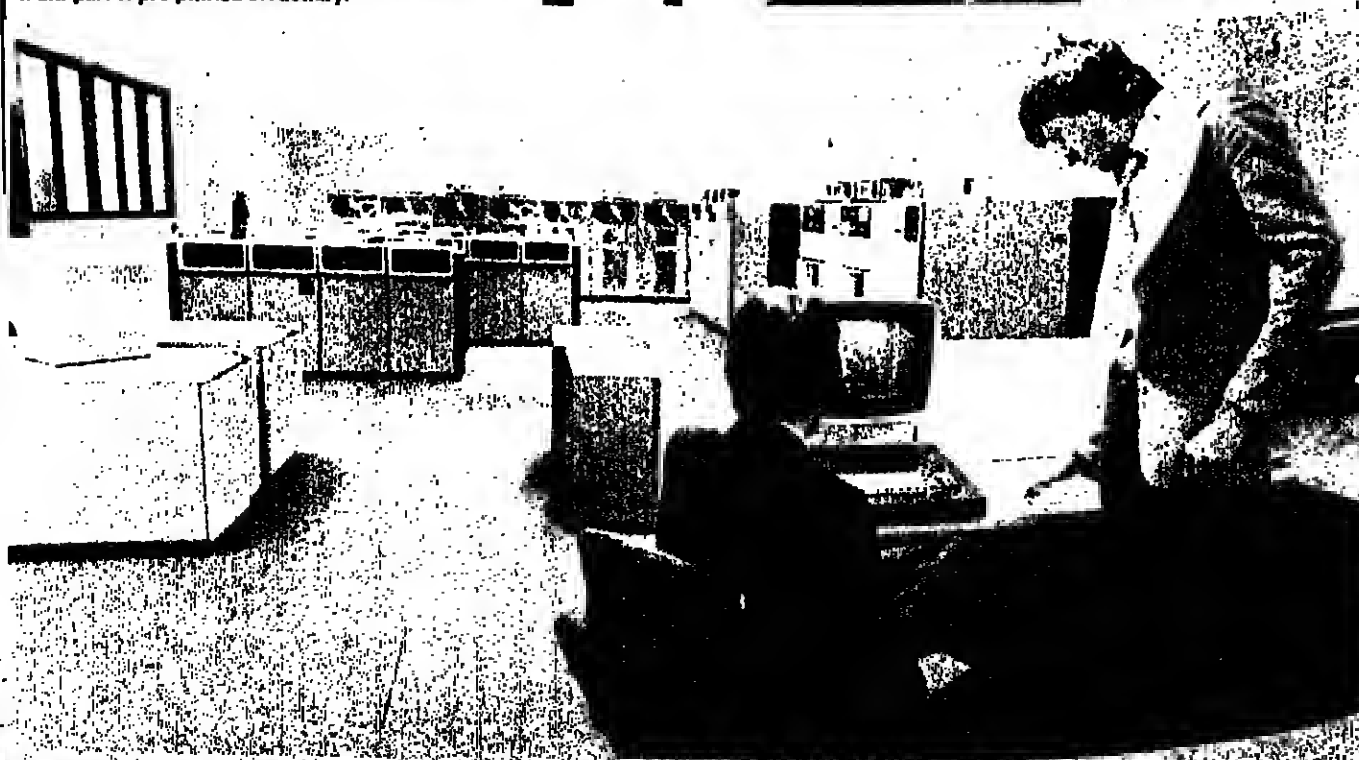
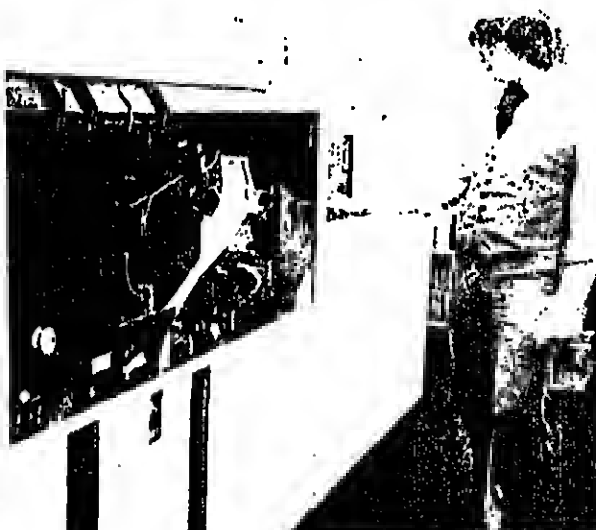
"THIS, sir, is our latest in printers. It's the IBM 3850 laser printer and is yours for around £210,000."

"For your money, you get all the mod cons. It's almost entirely self-cleaning, there is no nasty printer ribbon to change and, above all, it produces 14,000 lines per minute."

If by some quirk of circumstance a second-hand car salesman was trying to flog you an IBM 3850, that's the sort of spiel he might well come out with.

Thankfully, Dave Gilpin of Tesco isn't trying to sell the printer — he's just showing how to operate it.

Tesco uses two such devices to produce all its output, aside from that which must be printed on multi-part or pre-printed stationery.



Another view of the Tesco computer room

Shortage of cobalt could force DP industry to re-design its products

Bohdan Szuprowicz reports from New York

SHORTAGES of cobalt-based magnetic materials used in DP equipment, telecommunications, instruments and other electronic applications are likely to persist in the foreseeable future, according to experts at the recent Internag Magnetism and Magnetic Materials Conference in New York City.

NEWS IN BRIEF

Computer aided policing

THE Police Committee of Manchester Council has given preliminary approval for a large-scale plan for computer aided policing.

This will involve a command and control system, computerisation of the Manchester Criminal Records Office, the Police National Computer, and any other systems as they become available.

Trucking with ICL

TO extend its online system and develop a database covering all its operations, fork-lift truck specialist Lasing is to install two ICL 2860s at its headquarters at Basingstoke, Hants. The machines, costing £1.5 million, with a total capacity of 3.5 Mbytes, take over from a 1904S, one 2860 running under DMK to ease transition, and the other running under VME/B to develop new systems.

Agreement

MEMOREX and Olivetti now have an agreement under which Olivetti will build the IBM 3270 compatible Memorex 1377 terminal under licence in Italy for sale there, while Memorex will build high speed thermal printers from Olivetti for use with 1377s sold all over the world.

Cutting fleet costs

A TURNKEY system called Vehel and based on the 1500 microcomputer has been launched by ICL. Priced at around £13,000, the system is designed to help cut vehicle fleet costs by monitoring performance and providing information on fuel consumption and maintenance costs.

1,000 viewers

OVER 1,000 microfiche viewers worth more than £125,000 have been ordered by HM Stationery Office from Euracom Dahn, the computer output microfiche bureau that also builds and sells viewers. The Micron 750 viewers on order will be used by the Ministry of Defence (Navy) to increase the stability of Southern Africa, has forced many cobalt users to consider substitutes.

Array installation

SEISMIC data processing specialist Compagnie Générale de Géophysique has installed a Control Data MAP 111 array processor worth about \$500,000 at its London centre in Acton, where it is running with a CDC 6400 mainframe. CGG has similar configurations in Paris, Houston, Denver and Calgary.

First end-user sale

IN its first end-user sale following an OEM agreement with Hewlett-Packard, Eurocom Computer Services is to supply a 2100,000 turnkey system to the West German subsidiary of Matsushita.

Delegates from the US Bureau of Mines, Bell Laboratories, Hitachi Magnetics, Westinghouse Electric and General Electric recommended switching to non-cobalt based magnetic materials, hybrid designs with lower cobalt content, redesign of equipment, reversion to electro-magnetic designs whenever feasible and even recycling of cobalt-based scrap.

Computer manufacturers are affected because cobalt-based alloys are extensively used in manufacture of permanent magnets for high performance electric motors, instruments and telecommunications equipment.

A typical computer installation may include several dozen electric motors in printers, tape and disc drives, and step-motors for various applications in a variety of devices.

Some observers believed that between 30% and 40% of cobalt-based alloys will disappear from use in the western world within two years.

Severe shortages of cobalt first developed during the summer of 1978 when Marxist rebels from Angola invaded Shaba province of Zaire in central Africa and disrupted production of Katanga copper mining areas.

Cobalt is a by-product of copper production and the Katanga mines account for about 60% of free world cobalt production. The second largest cobalt producer is the Soviet Union which, with Cuba, is estimated to produce close to 20% of global cobalt output.

As a result of these developments, cobalt supplies were disrupted and its price escalated from about \$8 per pound in 1977 to \$25 in May 1979.

In addition, actual cobalt demand for electronic and other critical uses in jet engines, machine tools and petroleum catalysts has been running higher than available supply.

This in turn led to the emergence of the so-called "free" cobalt markets where prices of the metal reached \$30 and even \$50 per pound.

A cobalt distributor in the US, African Metals Corp, has returned its customers to 70% of their 1977 orders. Coupled with price increases and uncertainty about the stability of Southern Africa, has forced many cobalt users to consider substitutes.

Introduction of ceramic materials in some magnetic components in computer equipment is directly linked to the cobalt shortages and price increases. Another substitution possibility is samarium-cobalt based magnetic materials that use a smaller percentage of cobalt.

Computer manufacturers, however, face a trade-off dilemma particularly when production volumes of particular products are not very large.

Re-design of such products to use other materials may be too

expensive to remain competitive and, if the demand for a particular magnetic alloy is not generally large, they may even have a hard time finding a supplier willing to make the alloy. On the other hand they risk further shortages, disruptions, or price escalations if cobalt supplies are again affected by political or military action.

Although cobalt is fairly abundant in nature, high grade deposits are few. Such a large proportion of cobalt production is concentrated in one area of Zaire, that it is becoming a tempting target for those interests who see political or economic advantages in creating cobalt shortages and price escalations.

Although Australia, Finland, Morocco, Canada and Zambia are also cobalt producers in the "free world", their combined production is only 50% as large as that of Zaire.

What is more, in the case of an emergency, jet engines, machine tools, and petroleum refining catalysts are more likely to receive priority for limited cobalt supplies than commercial electronics.

This is further aggravated by the fact that the US strategic stockpile of cobalt is well below its 85 million pounds goal and is also restricted to use by defence industries.

Another factor affecting the supply is now believed that West Germany, France and the UK have begun secretly to build up their own cobalt stockpiles.

The Soviet Union, long believed to have been self-sufficient in cobalt, also purchased 300 tons of the metal in 1978 giving rise to speculation that it may become an importer of cobalt in the future.

Cobalt is among the 10 most critical materials rated by the US Army War College strategic materials vulnerability index. Other metals such as chromium, platinum, palladium, tantalum, nickel and aluminum also rate very high on this index.

As a result, the wisdom of developing cobalt substitutes which rely on use of other even more strategic materials is also being questioned.

One of the most promising materials as a substitute appears to be a Japanese alloy based on a mixture of manganese, aluminium and carbon and is rated to be better than ferrite materials also not as good as cobalt-based alloys.

But this alloy, developed by Matsushita, is not yet available outside Japan and it also uses manganese, a metal rated more critical than cobalt by the vulnerability index.

It seems that computer manufacturers and end-users alike might do well under the circumstances to set up their own strategic materials vulnerability index to help them avoid the effects of future disruptions and price escalations over which they have little control.

How to stop having to explain why the computer won't do everything the boss expects



Every DP man has had the experience of explaining to management the limitations of his system. With any system based on applications, limitations are inherent — and removing them discouragingly expensive.

Dataskil's IDMS removes the need for those embarrassing explanations. It enables your system to carry out what the MD demands — cheaply. You can add whole new files without re-writing programs, bring new departments on line without rearranging all the data. Integration of systems need not be brought to a halt by expense when only three or four applications have been linked in; and you can integrate with TP systems too.

And, incidentally, run times can be significantly reduced.

All this makes for a much happier working environment for your staff. But from management's point of view the important thing is the saving of money. IDMS (Integrated Database Management System) has typically saved 30% of both development and maintenance costs in the field.

IDMS is obviously particularly suited to businesses in which a number of different user departments need to look at the same sets of facts from different points of view: good examples include construction, banking and insurance, and production and stock control in general manufacturing. It is simple to use — the language is a high level one based on COBOL. And it conforms to the CODASYL standard.

Satisfied users include British Aerospace, Tootal, George Wimpey and Short Brothers.

Ring Brian Nunn, of the Marketing Department, on Reading (0734) 581258 for an exploratory talk. Or write to him at ICL Dataskil, Reading Bridge House, Reading, Berkshire, RG1 8PN.

ICL Dataskil

The Computer Professionals

Special travel arrangements to visit SYSTEMS (Munich)

IPC Electronic Press Ltd. The world's largest publishers of computer-related and electronic journals, in association with Commercial Travel Ltd. have arranged special visits to SYSTEMS The cost

includes: travel by scheduled airline from Heathrow * first class hotel accommodation * arrival and departure transfers * admission to the trade fair * services of an experienced tour manager. The programme comprises of the following tours:



Tour A: September 17-19 at the Sheraton Hotel, Sharm El Sheikh, Egypt. Single room supplement £15 per night. Tour B: September 17-21 at the Sheraton Hotel, Sharm El Sheikh, Egypt. Single room supplement £15 per night.

Please send details of the tours indicated above

NAME _____ COMPANY _____

ADDRESS _____ Tel _____

PEOPLE AND EVENTS

By Judith Morris

Top jobs with new Marconi operation

A NEW operation has been set up by Marconi Avionics in Nailsea, near Bristol, and Chris Frost has been appointed manager at the site. He has been divisional manager for the company since 1968, and before that was chief engineer of the Instrument Systems division. Frost led the team which developed the world's first modular air data computer.

Malcolm Budge has become area sales manager for Hallmark Computers. He will be responsible for the City and the South East London area. Previously he was in sales management with Reuben Vickers and Sankey Sheldon.

Warren Palmer has been appointed general manager of Recognition Equipment, where he will be responsible for all operational activities in the UK. Palmer was UK country manager with Memorex, before forming his own consultancy.

Arnold Buhmann has become general manager of the Americas and the Far East for Ampex International. He is currently manager of the Switzerland and Eastern Europe region at Fribourg. Talking over this position is Gerd Baumhof, currently Ampex International regional manager in Sweden. The new regional manager for Scandinavia is Willy Bjorklund.

Systek man dies in Fastnet race

AMONG the casualties in the Fastnet Race was Roger Wette, 33, director of technical services at Systek, the London-based systems house. He left a widow, Hilary, and a five-week-old son, Gorrard.

Wette was crawling on the floor in his home in the Farnham area, when he was swept away during the gale. The yacht made several passes in an effort to pick him up but the rescue bid was unsuccessful.

Wette and Mooney had worked together at Sanderson, the fabric and wallpaper manufacturers, where Wette had been divisional systems manager. After leaving the company Wette, who was a specialist on communications and CICS, went freelance and was in Holland for about a year working with IBM and 3M on various software projects. He returned to the UK and joined Systek in July.

A trust fund is being set up by his colleagues and already contributions have been received from friends in Holland. Anyone wishing to have details of the fund should contact Michael Le Coats at Systek, 18 House, High Road, North Finchley, London, N12 0AZ. Tel: 01-349 2011.

COMPUTER COURSES

from The Oxford Business School for British Computer Society Association Examination and for Management Briefing. This new series of courses combine the convenience of being able to study at home with the benefits of a personal tutor available by telephone plus optional seminars. For written leaflet and application form write to The Director, Dept. 243, Oxford Business School, 88 Bonhill Street, Oxford OX2 8BP, or telephone 0865 54231 (24 hrs.).

Gordon Machen, formerly advanced planning manager for ICL's corporate information systems department in London, has joined Auerbach Simplot to head the company's operations in Canada. The company markets training, techniques and implementation kits in the Americas and Israel.

Ash Emery, previously marketing manager of Protea Computers, has been appointed general manager of the company. Before joining Protea, he was with Computer Sciences in South Africa. Former general manager Edwin Scholze has now retired to develop his own business.

Warren Naklsner and John Chire have joined BIS Applied Systems training division. Naklsner will lecture on public and in company training courses. He had been involved in public sector training before joining BIS. Chire, whose most recent position was with the marketing team at Atkins On-Line, has been appointed as a consultant for sales.

Glen Armstrong has joined the engineering division of the Exchange Telegraph company as assistant general manager of sales. He was formerly with the bureau RRS, where he was responsible for developing an on-line system.

Peter Flower has become computer services manager of NCB Computer Services. He has been development manager at the Relgate Centre since the formation of NCB computer services. He succeeds Martin Ballinger, who has taken the position of company secretary of Western National.

Geoff Sweeting has become marketing manager for retail and distribution with Systime. He formerly worked for Comet Warhousers, where he was recently involved in the design and installation of a Systime system.

Paul Murphy has joined Lexidata as corporate controller, with overall responsibility for financial management of the company. He was formerly a certified public accountant with Price Waterhouse.

Achie Thomas has been appointed director of the financial systems division of Chubb Cash, succeeding Bill Richardson, who has retired. Thomas has held senior positions with Perkins-Eimer and Plessey Communications. He will be based at the Chubb Cash headquarters at Hollingbury, Brighton.

Dave Dye has joined Inter-tek's sales team, from Borer Electronics in Wokingham, where he was also a salesman.

Richard Hawitt has become sales executive for Safa Computing's 2800 computer bureau. He was formerly a sales executive for Univac.



Managing director

Kelth Hoeking has been appointed managing director of BIS-Delluc. He joined the company in 1972, and assumed responsibility for marketing and the launching of operations in the Netherlands. He was appointed marketing director in 1977. Newly appointed operations director is Michael Grotti.

Mike Jones has joined Computer Instrumentation as a development engineer in the company's electronics engineering section, to work on computer-based systems development. He was formerly a design engineer and programmer with Marconi Avionics.

Peter Andrews is now sales executive for Westrex in Scotland. He was previously sales executive for Kodak Services.

Roger Puttick has been appointed territory manager for the new business branch of Computer Machinery Company. He is to sell CMC Reilly Royle and associated business control programs. Puttick has been a salesman for five years with CMC as commercial manager.

DIARY

SEPTEMBER 5-8 IBM CUA management group. De Vere Hotel, Coventry. Tel: 01-551 1643.

SEPTEMBER 8 The future of real time languages in process control. SCS Process Control specialist group. Reading University, Reading, 10.00.

SEPTEMBER 10 Database systems and information retrieval. SCS Information Retrieval group. Computer Laboratory, Cambridge University, Cambridge.

SEPTEMBER 11 Performance management. IDPM West London and Oxford branch. Teasdale House, Hatfield Road, Slough, 10.30.

Bar-coding techniques in stock control. IDPM. Hull Crest Hotel, Ferryby High Road, North Ferryby, Hull, 10.15.

The next ten years in computing. ACM. BCS HQ, 13 Mansfield Street, London W1, 10.30.

SEPTEMBER 13 Optimal control of large scale systems. IES, Savoy Place, London WC2R 0EX.

IBM CUA Scottish group. Waverley Hotel, Perth. Tel: 01-551 1643.

Shape recognition and artificial intelligence. AFTEC and IRIA. Toulouse, France.

SEPTEMBER 17 An afternoon with James Martin. IBM CUA and Butler Cox Associates. The Grosvenor House Hotel, Park Lane, London.

SEPTEMBER 17-21 Computer science and law. Course. CREST and SRC. Swansea University, Swansea. Tel: 0782 25878 ext 502.

SEPTEMBER 25 Aspects of a computer controlled digital telephone exchange - the Plessey PDX. IETE. Granville College, Sheffield, 10.00.

SEPTEMBER 28 Introduction to microprocessors. IETE. Leleux Centre, Stevenage, 10.30.

SEPTEMBER 28-29 Computers in cardiology. IEE Computer Society. Geneva, Switzerland. Contact Computers in Cardiology, Centre de Cardiologie, Hôpital Cantonal, 1211 Geneva 4, Switzerland.

SEPTEMBER 29-30 Computers in cardiology. IEE Computer Society. Geneva, Switzerland. Contact Computers in Cardiology, Centre de Cardiologie, Hôpital Cantonal, 1211 Geneva 4, Switzerland.

Andy Timms and Paul Tahner have become part of Jovian Systems, the Midlands based management services consultancy. Timms was previously with IBM and now becomes a senior programmer.

Jim Pilton and Roy Cox have joined Linotype-Paul's scanner division as UK sales representatives. Pilton was previously with the pictorial machinery division of the Monotype Corp. in the sales divisions, and Cox formerly worked in Eastern Europe in export sales.

Division 1
Bathurst 0, Geydon 1
Bathurst 2, SIA 7
Division 2
Bathurst 0, Geydon 1
Bathurst 2, SIA 7

ONE BENEFIT FROM THE TV STRIKE...

...NEARLY HALF THE POPULATION...

...WILL BACK OUR CAMPAIGN TO REDUCE...

...THE HAZARDS OF VDU EYE-STRAIN!

...THE HAZARDS OF VDU EYE-STRAIN!

...THE HAZARDS OF VDU EYE-STRAIN!

...THE HAZARDS OF VDU EYE-STRAIN!

Real time data in Europe

THE first European conference on real time data handling and processing, called Real-time Data 79, is to take place in West Berlin from October 21-25. Organised by Purdue Europe, the ESCO Committee and the European Conferences Association, the event is sponsored by many European bodies including the EC, NATO, the Ministry for Research and Technology for Germany.

The main theme of the conference is the standardisation of electronic hardware and software as applied to real time data handling and processing. Major topics will include: standards and their commercial aspects, applications to industry, medicine, and systems architecture.

For further information contact: Real-time Data 79, Congress Organisation Company, Kongress Zentrum, John-Foster-Dulles-Allee 10, D-1000 Berlin 21.

CONFERENCES

THE implications of videotext and Teletext will be discussed at the Professional Videotext Exhibition on November 7-8 at the West Centre Hotel, Lillie Road, London. The exhibition is aimed at those who will be involved in operating and using videotext. It is sponsored by the magazine Videotext and TVR Ltd, and has the support of the Association of Videotext Information Exchanges, the Post Office and the Department of Industry.

TWO IVE experts are to meet at the International Data Design Conference to discuss the latest developments in data and software design. The conference will be held by invitation from September 10-12 at the London Press Centre, as part of the company's State of the Art series. Speakers will include Sir Gordon of Information Sciences, and Sir John Guller of the University of Toronto.

THE management studies centre (MISC) is organising the West Midlands Equipment Display and Conference in November. The conference will be held at the Stockport College of Technology, from November 14-16. The conference will present a briefing of all equipment being demonstrated, and the afternoon's activities will include case studies from experienced business users.

FOR the benefit of many people involved in the organisation of road transport, or in industry, public service or government, Overseas International Business Communications Ltd is to hold a conference in London on September 18-19. The conference will cover the role of the computer in road transport planning and will include detailed planning of road journeys and depot operation. For details, contact Ian Gull at Overseas International Business Communications, on 01-242 2484.

THE fifth international conference and exhibition on electronic displays is to be held at the Mount Royal Hotel, Manchester, from September 4-8. Some 45 companies will be represented at the show, which hopes to cover all aspects of electronic displays from liquid crystal displays to large screen displays. Chaired by Professor R. Chandra, of the University of Sussex, the conference is organised by Network, which can be contacted for further details on 0208 5228.

MIAMI BEACH is to be the venue for the 80th conference of the data interface '80, the conference of data communication, DDP and network, which will be held in March 1980. Organised by Datacom, the conference is aimed at the user, principally at data management. Details from Datacom International, 180 Spring Street, Framingham, MA 01701.

ENGINEERING software is the theme of an international conference and exhibition which is to take place from September 4-6 at the University of Southampton. The conference aims to provide a forum for the presentation and discussion of research in engineering software and to present engineering software to the public. The conference is organised by the Engineering Software Society, 128 High Street, Southampton, SO1 1AA. Tel: 0703 2141.

MICRO NEWS

National Semi chases IBM with add-on memory products

WHEN IBM announced the 4300 line, the ripples from the launch spread far beyond the company's most immediately affected. Minimakers felt the wash right through their business and thought themselves obliged to react, down to offering memory products to compete with the \$15,000-a-Megabyte price tag IBM put on the 4300 memory.

"That was crazy," says Bill LeDuc, product marketing manager at National Semiconductor's microcomputer systems division in Santa Clara. "The IBM product, using 64K chips, has a cycle time of 1.2 microseconds and they won't be shipping it in quantity until 1981 — but the microcomputer manufacturers felt they had to match the price right now, even though their product runs at twice the speed, 600 nanoseconds."

The microcomputer systems division was started some four years ago, and specialises in add-on memory for DEC, Data General and Hewlett-Packard

minicomputers. As a result, dramatic price movements and products like the new Digital Equipment LSI-11/23, in which memory is bundled, make it difficult for the independent suppliers.

"DEC is almost giving memory away on that machine," says Bill LeDuc. "The independent suppliers like Plessey, Monolithic Memories and ourselves only compete by offering more features on the product, and prices 15% to 30% below the manufacturer's price. If you are first in the field with a product then you can get away with 15% but if there's a bunch of others already there you may have to give much bigger discounts. Our aim is to provide memories which

make the machine run faster, and all our memories run at least as fast as the processor will handle."

Latest products in the line include the NS11L, not yet formally announced, the NS23P, NS11Q, and NS11E, all aimed at the DEC world, and the NS D/3 for the Data General Nova 3.

Ray Jones has just been appointed director of marketing for the division. Previously he did the software for the NS11E, which includes ECC, single bit error correct, multiple bit error detect circuitry.

"The NS11E, for the PDP-11 line has an error logger on board to pinpoint bad chips. We wrote a software package for the mini which automatically switches in the spare chip we put on the board and switches out the faulty one."

"It also prints out an error message on the console printer or whatever output device is being used. Thus the user is able to keep his system up and running, and indeed the failure can be completely transparent to the user. The service engineer simply replaces the faulty chip the next time he calls."

The feature also reduces the inventory which stockists need to maintain, so that a stock of chips plus one spare board to take care of catastrophic failures is all that is needed.

The NS11E also requires only a single five-volt power supply, making it attractive for use in remote sites and where battery back-up is needed.

"The chip density on the card is close to the limit," says Bill LeDuc. "By using address and

data latches which free the bus within 100 nanoseconds of a write operation and using a 13-bit byte, correcting on a byte rather than a word basis, we achieve the same performance as non-error-corrected memory. Doing a 26-bit word costs us an extra chip, but it is worth it. The standard product is 64K words, using 16K chips, but it will also take 4K and 8K chips, the latter being 18K devices in which one element has failed."

The NS11Q provides 128K words for PDP-11 models; it does not include ECC circuitry, but features an on-board parity controller where DEC requires a separate card. Not only does this free up a slot but it saves about 350 nanoseconds in access time. National Semiconductor claims that with a 300 nanosecond access and 450 nanosecond cycle time it is the fastest memory in the PDP-11 world. The NS11L will add features such as the single 5-volt supply to the NS11Q.

Although National Semiconductor was last in the field with memory in the half-size board used in the LSI-11 line, it still managed to steal a march on competitors: designing it, it found it was the only independent offering all the features required on the new LSI-11/23 in its NS23P memory.

For the Data General Nova 3, the company offers the NS D/3, 128K words of 22-bit memory with ECC which it says is still the only error-corrected memory available for the Nova 3.

National Semiconductor got into the business following a big contract from Hewlett-Packard

OEM, which wanted a custom memory product for the HP 21MX. Having developed the memory, the company decided to offer it to other Hewlett-Packard customers. It remains the only MOS memory for the 21MX available from an independent.

"Our market divides into four segments," says Bill LeDuc. "There is the classic OEM who typically wants 500 cards a year. Below him is the systems integrator, who wants up to 100. Then there are the multiple unit buyers, large companies."

"Finally there is the end-user. We have been concentrating on the first two, but we are in process of setting up a whole new sales channel for the low end of the market."

"We operate as an autonomous unit; we have no particular plans to go after any other minicomputer base, although if someone came up with a custom contract we might well turn the result into a product if the potential volume looked right."

Honeywell's Level 6 mini has leapt from nowhere to number four in the mini market: is that a potential target?

"We've looked at it, but Honeywell has designed that product pretty well," says LeDuc. "Their mother and daughter brand concept (up to four small boards mounted on a large mother board) makes it difficult for independents. No, our job at present is to build market share."

"There is such a shortage of 16K parts right now that Siemens, which planned to enter the US market with a plant manufacturing 64K chips has decided to do 16K as well. If you want 16K parts in a hurry you have to pay for short delivery, but we are fortunate in being able to ride on the back of National Semiconductor's memories for IBM 370 and IEL AS/4 and 5 machines."

An expanded version will also be available, offering up to 2 Mbytes of store. This is the IBM 80M, and when interlaced to a Multibus via a PBM 80M controller card, will provide an average access time of 7 milliseconds. The memory will cost £3,000, the card £500.

By Martin Banks

Basic for Nascom

THE first consignment of 8K-byte Basic cassette tapes for use on the Nascom 1 micro-computer kit has now been delivered to Nascom by Starbase, the company recently started by ex-Nascom software director Tony Rundle.

The language is a modification of the Microsoft Basic interpreter originally developed by Rundle for the Nascom 2 version of the kit. Here it was designed to be local in ROM. The tape version uses the same approach of copying variable data into a workspace area, so it can also be committed to silicon if required. A minimum memory of 16K bytes is required to support the language.

Priced at £30, the tape will be available through the Nascom dealer network.

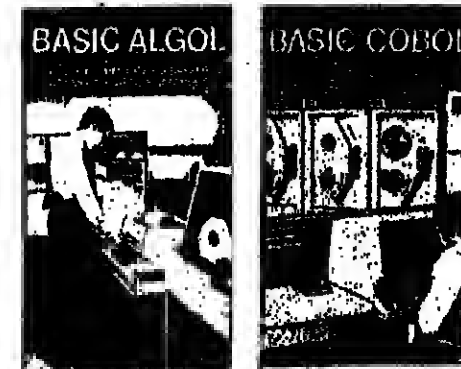
Plessey introduces bubble range

NOT to be outdone by Intel's announcement earlier this year of its entry into the bubble memory market, Plessey Microsystems, currently Europe's only bubble memory manufacturer, is introducing a range of systems compatible with the Intel Multibus.

Scheduled for launch next month, the range is based on Plessey's 64K-bit device.

The PBM 80S is a single card memory offering 500K bits. It has a data rate of 100K bytes per second when operated as a program loader or backing store. It will cost £1,350.

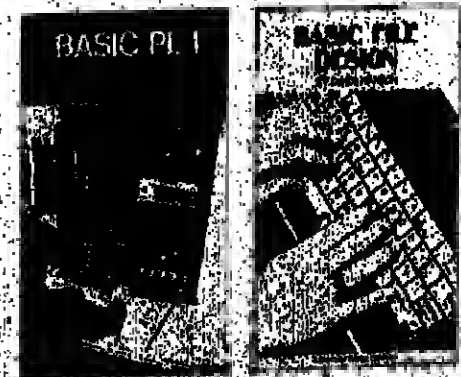
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'Basic Algol', 'Basic Cobol' and 'Basic PL/1' are clear, concise introductions to three of the most commonly used programming languages. Each takes the newcomer to the stage when he can write simple programs himself in the language concerned. 'Basic File Design' is intended for the DP professional, providing him or her with a brief but wide-ranging review of the whole subject. Invaluable to any programmer, systems analyst or DP manager anxious to improve file performance.

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INTRODUCTION TO PASCAL

PART 10

By Dr JUDY BISHOP

Decision to change

THIS series has attempted to describe the elements of Pascal and give some insight into how it is used, that is, how Pascal programmers think. Interesting though it may be, it will have been of no more use than a series of Noddy stories if it has not stimulated you to stop and think seriously for a few minutes. "Should I use Pascal?" A better way of phrasing the question is to break it into two parts: should I change my language and, if so, should I change to Pascal?

Should I change languages?

There are few computer linguists these days and few firms that encourage them. With the major languages (Cobol, Fortran or Basic) the situation is even worse in that most programmers are steeped in a particular dialect of their chosen language. For instance, one seldom sees advertisements for Cobol programmers per se. It is always IBM 370 Cobol or ICL 1900 Cobol, and many an unsuspecting novice has been confused by the vagaries of Manufacturer X's own special Extended Basic. Thus an individual is likely to be, by force of circumstances, satisfied with his language and unwilling to undergo the trauma of learning the ins and outs of a new one.

This is short-sighted and introspective thinking. It took a lot of courage in 1910 to switch driving habits from a horse-drawn carriage to a model T Ford. Can we afford to stave progress in the face and refuse to acknowledge that it is progress?

Cobol and Fortran were designed when computing was in its infancy (circa 1960) and surely we must believe that improvements worth noting have been made since then. After all, hardly anyone these days would willingly fly across the Atlantic in the once popular Comet.

If these considerations should weigh with an individual, there is even more cause for a large organisation to be aware of and to be open to new trends. There are deficiencies in the 1960 languages. To be frank, they are not even adequate any more. Therefore, why stick with a language merely for loyalty's sake, or because "everyone else uses it"? "Because it is too expensive to change," comes back the answer, loud and clear. Before answering that one, let us look at one more question of principle.

Is it worth it?

What do I stand to gain by changing to one of the newer languages (there is no sense in switching to a work-horse that is equally old and decrepit)? First of all, you will be a leader in the field, ahead of the times and able, to some extent, to put your stamp on the development of the trend. This kind of advantage is hidden, though what about practical, money-making advantages?

I hope that this series has shown that a new language like Pascal has two great differences over its forebears. It emphasises security — no silly mistakes, no undetected errors — and so, up goes programmer productivity. This has been made startlingly clear in classes at universities where the student programming output has increased in both quantity and quality.

Pascal also places great reliance on a single, machine-independent and international standard language. It is ironic that one of the reasons for sticking to Fortran or Cobol is usually that "it is standard". Any programmer who has used more than one compiler in his life knows this to be a complete fallacy.

But Pascal goes further than just a language standard — there is a common sublanguage among programmers that enables programs to be instantly readable. I have read large system programs written at a variety of installations in Switzerland, Ireland, Minnesota, Poland, Tasmania, all with the barest comments and no documentation whatsoever.

"Think of it, no more dialect, in-house rules to avoid them, or maintenance problems when programmers leave. The new programmers will be productive without extensive "immigration" courses.

But what will it cost?

Sure, we can dream dreams, but there are real live

considerations to changing a language. The first is usually equipment, but in the case of Pascal, compilers are now available for nearly all machines, and an increasing number of manufacturers support it and compilers are also frequently obtainable at low cost from universities, research establishments or individuals.

The second, and astronomically larger, cost is that of retraining staff. So let's be realistic. No manager is going to walk into work on Monday and say, "Right chaps, we'll all write Pascal from today." There is, however, a way of promoting progress effortlessly. Soon, if not already, all university graduates will be fluent in Pascal.

A company can take advantage of this open situation by letting a keen employee obtain a Pascal compiler and write the old stand-alone program. Perhaps he or she could give an in-house course. Most of all, the firm could join the Pascal Users Group and keep abreast of what's happening through the quarterly Pascal News.

A warning

At this point, I must voice a warning against changing Pascal into something else without changing its name. If you decided to put your favourite feature into Pascal, please call the language something else.

The US Department of Defence has been much in the news over its attempt to find a common language for defence projects. Pascal was chosen only as the base for the language, which is growing rapidly, and now goes under the name of Ada, after the first programmer, Lady Ada Augusta Byron Lovelace, who was a friend of Babbage. There is no harm in this, since the principles of Pascal are applicable under any name. On the other hand, one wonders why they need to change Pascal at all!

Why Pascal?

So, if a language is on the cards, why change to Pascal? The answer is that no other post-1970 language can remotely touch its popularity, universality and stability. Take popularity. In one edition of the small computer journal BYTE, there were no fewer than six articles on Pascal ranging from the daring "Pascal versus Cobol" to the enigmatic "In Praise of Pascal". Other magazines have followed suit and Pascal is now being offered in hard-wired form on microcomputers.

In this way, Pascal is a real challenge to the small computer language. Basic, but Pascal is non-sectarian and unchangeable (provided the "change me, change my name" rule is adhered to, and it seems to be). It filled such a wide need when it came out in 1972 that there is unlikely to be another like it. Certainly, in the past seven years the competition has been entirely academic. In short, a change to Pascal will have a permanence about it — for at least as long as a run as Cobol or Fortran have enjoyed.

In summary

Pascal is not only a language with more than the average number of good features; it also encompasses a way of life. Top-down design, communication through parameters, an abhorrence of abbreviations, are hall marks of the Pascal programmer's trade. It is rarely that one sees a bad Pascal program.

It seems as if Pascal arrived on the scene just as programming came of age, to become the livelihood of thousands and the hobby of twice as many. Programming in Pascal is just that much more enjoyable, productive and secure. Switch now — there is not going to be another language like it for a long, long time!

NEXT WEEK: To conclude this introductory series on Pascal, Professor David Barron, head of computer studies at Southampton University, has compiled a bibliography that provides the student with a comprehensive guide to further study of the language.

Speeding the design of structures

Whether it is a Saab car or a giant North Sea oil rig that you want to design, mathematical simulation can provide a speedy and cost-effective solution, and Computas of Norway believes it leads the world in what it calls super element technique. TIM PALMER reports from Oslo.

THE traditional method of testing structures which have to withstand a wide variety of forces and environmental hazards has been to build a laboratory model and examine how it behaves in simulated conditions.

However, mathematicians have long been aware that a very rigorous approach to testing of multi-element structures could be carried out without ever building the real thing.

The method involves establishing a mathematical definition of each element separately and then assembling the mathematical models into a super model of the complete structure.

At this point, mathematical simulations of various environmental conditions can be applied to the super model and each element separately redefined as necessary for any desired set of parameters.

Until 1980 the technique was little more than a mathematician's toy, since the number of equations which needed to be solved for even fairly simple structures was enormous.

The availability of large computers made it possible to apply the technique to practical problems. The Structural Engineering Division of Norwegian consultancy Computas, part of Det Norske Veritas shipping and insurance group, claims to have pioneered the technique and to have taken it further than any of its US competitors.

The advantages of this kind of structural analysis are threefold, according to Computas. It significantly reduces the time-scale for designing the structure; it is applicable to almost any kind of structure, however complex; and the cost advantages are increasing all the time as laboratory costs go up and computing costs go down.

The work is actually done on a Univac 1110, shortly to be replaced by an 1110/80, at the Flensborg service bureau, which is 40% owned by Det Norske

Veritas. The suite of programs, called Sesam-68, is also available in a version that runs on CDC mainframes.

Computas is investing an annual \$800,000 in development of numerical tools and Sesam-68 has been applied to design of North Sea oil structures, nuclear power plants and automobile design.

The concrete structures used in the North Sea cost \$1,000 million each, and in one application, where Sesam-68 was used to analyse the mix of materials to such a structure for ideal strength under all the adverse conditions which can occur in the North Sea, 720,000 equations had to be solved.

It was necessary to examine 33 different kinds of loading condition, and solutions took up 350,000 pages which were cut on microfilm, and 450 hours of computer time over six months was required on the 1110.

In the automobile field, Sesam-68 has been used by West German car manufacturers, by Saab and Volvo, by UK manufacturers, Renault, France and Fiat, Lancia and Alfa Romeo.

Starting with a mock-up of the car body, the elements are drawn out on a mesh and the co-ordinates of each are automatically registered and transferred to magnetic tape.

The 11 most severe loading conditions are then applied in simulation to the assembly and any one part which proves inadequate can be quickly reshaped to meet the requirements.

Once the stresses in each part have been established under the loading conditions, Sesam-68 can define the minimum amount of material required for each part.

In this way Saab, for example, was able to save 20 kilograms of steel in one model of car, which meant a significant cost saving for the company, and improved performance for the car.

Intel holds two trump cards in its fight for survival

DESPITE its widely publicised financial problems, Intel still has two extremely valuable and telling sales arguments to persuade doubting potential customers to take the plunge.

Firstly, the whole point of the IBM plug-compatible business is that the processors are compatible, and all the companies in the field will do everything in their power to ensure they stay that way. Thus no customer has to make a final break with IBM when installing a compatible processor; they can always run for cover back to the word.

Intel's other trump card is its relationship with Hitachi. The latter is in the computer business for the foreseeable future, whatever happens to Intel.

The possibility has been raised that Hitachi will enter the mainstream computer business under its own flag, but at present this looks very unlikely.

Unlike its nominal Japanese partner Fujitsu, which has 28% of Amdahl, Hitachi has no financial involvement in Intel.

• If the company can soldier on until IBM announces the V-series, what many of the uncertainty now assailing users will be resolved. Its relationship with Hitachi could enable Intel to continue to be a thorn in the side of IBM.

and seems uninterested in entering the US and European markets in its own right.

"The easiest thing for them to do would be to buy us, and they have no interest in doing that," an Intel spokesman commented to Computer Weekly, adding that Hitachi was a very conservative company and was therefore likely to continue its present marketing arrangements for the foreseeable future.

"Hitachi uses Intel for market research, and relies on us to predict what IBM is likely to do in its future systems, which is often contrary to their own design inclinations. We tell them where to put in options which can be activated or extended subsequent to new IBM announcements."

This aspect underlines Hitachi's conservatism, and again shows a marked contrast to Fujitsu. The latter does make full use of its relationship with Amdahl to glean this kind of information, but Fujitsu also has a formidable web of contacts in the US, and some in Europe, to supplement the design and market intelligence gained from Amdahl.

It is not difficult to get information from and about Fujitsu, its products and plans, but it is almost impossible to get similar information about Hitachi. Having entered the plug-compatible business below Amdahl with machines built by National Semiconductor, Intel in the US is now competing head-to-head with Amdahl across almost all its product line, and has effectively dropped out of the business below the IBM 3031 level. It therefore appears to have decided, like Amdahl, that the market sector to be occupied by the forthcoming IBM H-series, now forecast for the second quarter of 1980, is the

most promising.

Its one remaining National Semiconductor machine, the AS/7-7031, is a strong competitor for the 3031, and falls below the Amdahl 470V/5. The Hitachi-built AS/6-7032 is a single processor competing with the 3032 and the 470V/6, and the dual-processor version, called the AS/7-7033, competes with the 3033 and the 470V/7.

At the top end IBM offers an Attached Processor or Multi-Processor 3033, while Amdahl offers the 470V/8 and Intel the AS/8-7034, based on the Hitachi M-200H and claimed to be the most powerful of the lot.

The M-200H has formidable enhancement capabilities, since Intel's AS/6-7034 is the unprocessed version, but the Hitachi original is designed to be configured with up to four CPUs.

Fujitsu does the same with its own M-200, but Amdahl has resolutely turned its back on AP and MP configurations, maintaining that such complexes are insufficiently reliable and that it is much better to use the fastest technology available and build more powerful uniprocessors. The Fujitsu M-190 is almost identical to the Amdahl 470V/6, but the M-200 bears no direct relationship to the V/7 and the enhanced V/8 version.

As was the case with Smead Business Machines before Singer put it up for sale, most of Intel's problems appear to be concentrated in the US, and by contrast, several of the European subsidiaries are thriving, so that people are prone to ask "What Intel problems?"

While Intel is out of the mid-range market in the US, at least for the present, it is definitely still in it in Europe, and the remaining National Semiconductor AS/3-5 machines which Intel has to take to complete its existing purchase contract are likely to be shipped to Europe.

It now has two other models, the AS/7020 and AS/7030, for this market (CW, July 12) — but their introduction will not affect marketing of the AS/3-5.

"This is our biggest selling product in Europe at the moment," Intel told Computer Weekly, adding that of the 50 sold worldwide, 18 had been sold in Europe. The 7020 and 7030 — in fact a single, field-upgradable processor — come from IPL Systems of Waltham, Massachusetts.

They are at present sold in the US by Control Data as the Omega 4801 and 48011, but Control Data has never been particularly enthusiastic about the business, seeing it as a short-term means of selling more IBM-compatible peripherals. It could well happen, therefore, that Intel will adopt the machines for the US as well.

"We adopted the IPL Systems machines for Europe because they are good products, and we believe that the company has potential in the long run," said the Intel spokesman.

However, IPL cannot at present meet anything like our full requirement for machines of this class. The IPL Systems machines are more attractive long-term than those which have come from National Semiconductor, since they are built like the Magnavox M80, around a system bus, which

makes field upgrades and modular enhancement comparatively easy. By contrast the National Semiconductor machines are direct reimplementations of IBM 370 architecture using low-cost components.

The AS/7020 competes with the IBM 4341, and the AS/7030 is designed to compete with the unannounced E-series model above it. Full microcode assists for the VM/370 and OS/VS1 operating systems are included in the two models, and Intel promises to provide a DOS/VSE assist within one year of IBM making its first European ship-

ment of the product.

Why does Intel not adopt Hitachi machines to compete with the E-series? "Hitachi has an M-140F which would be suitable, but it is only 90% IBM-compatible, and to make it fully compatible would take two years," says Intel.

National Semiconductor is now entering the IBM-compatible end-user market in its own right, starting with the NS 8500, and rated at about the power of the 4341. It is believed to be similar to the machine which Intel has been marketing as the AS/3-5, and is currently being sold in New York, Chi-

A major restructuring is under way at Intel, not only in the mix of businesses in which the company is involved but also in the product line of computers offered. TIM PALMER reviews the current product line-up and suggests that whatever the ultimate fate of Intel itself, Hitachi, National Semiconductor and IPL Systems all have a vital interest in ensuring continuity of service to Intel machines.

cago, Los Angeles, Dallas and Atlanta. European marketing is planned for later this year or early in 1980.

Latest news on Intel's financial affairs is that the company has reported a loss of over \$60 million for the second quarter. Lay-offs are now over 500, including over 200 involved in the design, development and manufacture of computers. The Hawk development project to produce a new small processor has been scrapped, and Intel is seeking a tenant for the land in Rancho Bernardo where it had planned to establish a factory to build the machine.

The joint development project with Hitachi for a new machine to be introduced in 1981 is likely to continue, however.

Following the major deal with Hillman of Pittsburgh to raise money on the residual values of \$100 million of transport and computer assets on lease (CW,

May 31), two contracts for rail cars have been discontinued. Involved were a total of 6,150 goods wagons and 850 flatbed trucks worth a total of \$280 million.

The restructuring of the company still does not seem to be complete, and Intel is now understood to be working out reductions in its operating costs considerably in excess of the \$25 million it originally set as a target.

Despite this, Intel's newly streamlined plug-compatible business does look viable, and if the company can soldier on until IBM announces the H-series, when many of the uncertainties now assailing users will be resolved, its relationship with Hitachi could enable Intel to continue to be a thorn in the side of IBM. Even if Intel folds, Hitachi, National Semiconductor and IPL Systems all have a vital interest in ensuring that full service to customers continues.

COMPUTER WEEKLY is holding its Annual Ball on Friday, October 12 at the Royal Lancaster

Computer Weekly is holding its fourth annual Ball. Last year nearly 700 people attended what has come to be regarded as the computer industry's big night out.

This year the Ball will again be held under the patronage of the British Computer Society. And proceeds will once more be devoted to a deserving cause associated with the computer industry.

So why not help us to help others? And at the same time enjoy a pleasant evening with friends and colleagues.

COMPUTER WEEKLY Annual Ball

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Needs of European users

DRAMATIC differences in attitudes towards hardware maintenance between the UK and West Germany are revealed in a study published by Input Europe on the maintenance requirements of computer users in Europe between now and 1983.

It is based on the responses of 453 users in the UK, France, West Germany and Holland to an input questionnaire.

Asked about their attitude towards their kit being serviced by a third party maintenance company instead of by the hardware vendor, about 66% of West German respondents said that they had a definite preference for the vendor rather than a third party. In contrast only 41% of UK users insisted that the vendor maintain their kit.

The different attitudes to third party service could be partly explained by the responses to

questions about the cost of maintenance which showed that UK users were far more interested in an inexpensive maintenance contract than their West German counterparts.

Of the UK users 73% considered the expense of maintenance to be important, while only 16% of the West Germans shared this view. The rest of the West Germans that responded thought that cost was unimportant, compared with only 25% of UK users.

Big differences in attitudes to response times and repair times were also revealed.

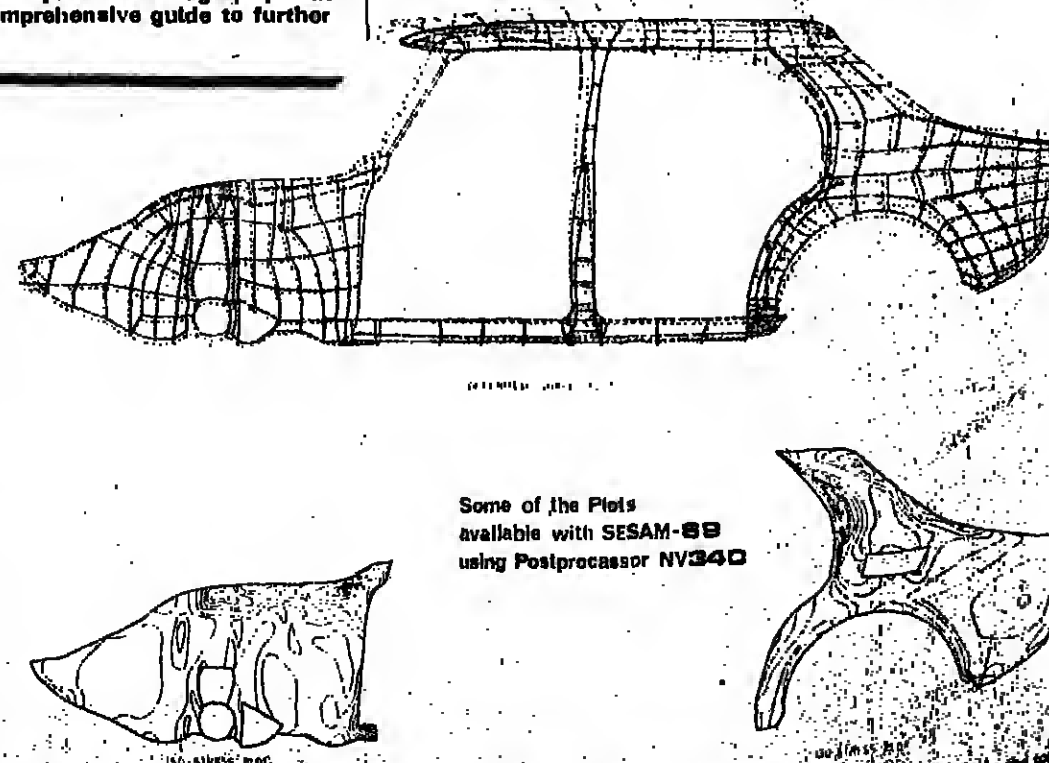
Users of mainframes in both countries expected more or less equally fast service, but for terminals and plug compatible peripherals users in West Germany expected maintenance engineers to get down and finish the job in about half the time demanded on average by UK users.

West German users of small systems also expected service to be twice as fast.

Maintenance requirements of the European information processing industry 1979-1983, 400 pp, £4.50. Input Europe BV, Empire House, 414 Chiswick High Road, London, W4 6TF.

Energy seminar

A SEMINAR to examine ways in which local authorities can conserve energy is to be held in Manchester on September 18. Arranged by the Local Authorities Management Services and Computer Committee, the seminar will be opened by John Moore, MP, Parliamentary Secretary of State at the Department of Energy, and it will cost £20 to attend. More details from the Director, LAMSA, 3 Buckingham Gate, London SW1E 6JH. Telephone: 01-826 2333.



Some of the Plots available with SESAM-68 using Postprocessor NV340

The illustrations show three of the plots taken of the Saab-99 car body during the design process. In the top illustration, the load-bearing elements of the car body are shown at rest, and, dotted, in a deformed position under a given stress. The other two plots show isometric lines which indicate the distribution of stresses in the front side member of the engine compartment, and the rear side panel.

Contact
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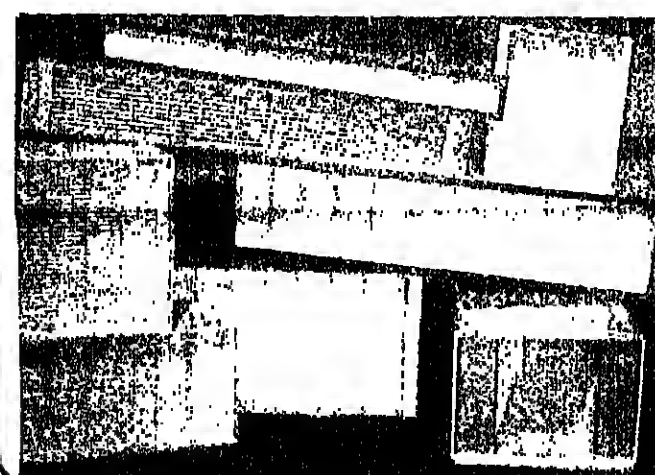
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Computers present special problems of fire protection, and serious hazards also arise from the electrical supply wiring, usually in the floor and ceiling voids. ROB STEWARD, of Bowcom Electronics, explains why it is vital to be able to detect and

attack a fire in a computer suite as soon as it occurs. He regards fire detection and extinguishing systems as fundamental to the protection of computers, and says that all fire detection systems should be approved by the insurers.

How to prevent fire in the computer room

IN any commercial organisation serious damage to the main computer system, or destruction of the recorded data, can result in an ultimate financial loss many times the initial capital investment in the installation, for computers present a high capital value concentrated in a relatively small space.

Although this is well understood by most computer users, they are sometimes surprised at the intrinsic vulnerability of the computer system to fire risks and at the insistence of insurers on very comprehensive fire protection arrangements.

Computers also present special problems of fire protection, two of which are of major importance: their high sensitivity to abnormal conditions of temperature and humidity, and the common use of PVC as insulation within the computer suite. At comparatively low temperatures PVC gives off hydrogen chloride, which is not only toxic but corrosive, and a small quantity can cause extensive damage to printed circuit boards and relay contacts.

A similar serious hazard arises from electrical supply wiring, usually located in the floor and ceiling voids. Local heating of PVC insulated cable can soften insulation between conductors, allowing arcing to occur with consequent gross overheating of certain sections of cable. The effect then becomes cumulative, rapidly building up the temperature until the PVC insulation starts to burn, giving off highly toxic and corrosive fumes.

Because of these considerations it is vital to be able to detect and attack a fire in a computer suite as soon as it occurs. Fire detection and extinguishing systems are therefore fundamental to the protection of computers, and all fire detection systems should be approved by the insurers for the purpose for which they are installed.

An indicator panel associated with the fire detection systems should be installed in a readily visible position in the computer area. Just as important, however, is the need to reduce the risk of an outbreak of fire to the absolute minimum. This entails the highest standards of "good housekeeping" and of general fire safety practice within the computer suite.

Fires also occur in the electronic hardware of the computer itself, the peripherals and associated equipment. Unlike older forms of electronics in which vulnerable components were chassis mounted, modern electronic systems usually consist of rows of combustible printed circuit boards mounted vertically in frames, and the free passage of air deliberately allowed for cooling can become free passage of flames or incandescent gases if fire develops.

obviously exacerbates the fire risk, while punched paper tape, used in many computer systems as the data input medium, must be one of the most easily ignited solid materials in common office use.

The plastic substrate of magnetic recording tape, normally held in very large quantities in the computer suite, is also highly combustible. Reels of this tape stored in metal containers present a comparatively small fire risk and may even survive a fire with recorded data still retrievable, but it is generally more expensive to store the tape in transparent plastic containers. These are also considerably lighter than their metal counterparts, and where very large volumes of tape-recorded data are housed on upper floors, plastic containers are sometimes specified in order to avoid overloading floor structures. But plastic containers burn, and although they offer various advantages, they do nothing to reduce the fire risk.

Few premises have satisfactory tape storage. In some the tapes are only separated from the computers by token glass screening; in others the tapes are stored in a separate room, but they may be too small and the tapes may overflow into the computer area.

All tapes except those actually being used should be stored in an adequately-sized room, with enough space to allow for future expansion of operations. The room should be separated from the computer area by fire-resisting construction.

Those tapes which are critical to the computer programs should be kept in a fire-resisting storage cabinet complying with the requirements of Appendix II of the CEA Standing Technical Committee's recommendations for the protection of computer installations against fire. As an added precaution, duplicates of these master tapes should be made and stored elsewhere (preferably in another building). This will ensure the minimum disruption of business should there be a fire in the tape store.

It follows from these arguments that adequate fire protection

should be regarded as part of the normal capital investment in the computer installation. Because of the exceptional economic risk associated with the computer suite it is naturally assumed that the precautions taken within the suite will be a great deal more elaborate than those in surrounding office areas, where it may be sufficient to ensure the safety of personnel, with only elementary protection of the material contents. The first essential external fire precaution of the computer suite is, therefore, prevention of the spreading into the suite from the surrounding area. This implies careful siting in order to provide escape routes for computer staff together with isolation of the suite from the surrounding area by means of fireproof walls, partitions and doors.

Swift and efficient handling of waste materials is fundamental to "good housekeeping". If not cleared away regularly, accumulations of waste form an ideal place for fires to start.

The amount of paper used in computing varies enormously

Swift and efficient handling of waste materials is fundamental to "good housekeeping". If not cleared away regularly, accumulations of waste form an ideal place for fires to start.

from firm to firm, and can be as much as one-and-a-half tonnes daily. A certain amount of this will be wasted during the process, and ancillary processes such as cutting, chopping and punching will produce more waste. There may also be spoiled tapes.

All waste material should be kept in metal self-closing bins, which should be emptied at regular intervals — say twice daily. Where throughput is such that there is a large amount of reject paper and other waste materials, a compactor and baling machine can help reduce the fire risk. The important point is to reduce the amount of combustible materials in the computer suite to the minimum.

As well as the principal danger of a fire in the paper store spreading to or affecting the

"By the time this fire becomes detectable to the human senses, it is often too late for simple measures and a serious configuration has already started."

computer, it must also be remembered that the destruction of the paper store by fire can cause a serious loss of throughput.

A firm which services a large number of customers may have in store several hundred different types of stationery in large enough quantities to deal with several million lines of printed output a week. The problem can be aggravated by the tendency to stockpile several months' supply of paper to overcome delays in deliveries. The quantity of paper in such

cases presents a major hazard. Paper and other materials should be kept in a minimum within the computer suite itself. The store room for larger quantities should have sufficient space for the proposed quantity and should be separated by fire-resisting walls, doors and floors from the computer suite.

All personnel should be fully instructed in the action to be taken in the event of a fire. In a firm using computers there may well be a high rate of staff turnover, but every effort must be made to ensure that staff know the special emergency fire procedure for the computer suite. This should be worked out in advance to cover every foreseeable fire situation and should be clearly displayed in notice form as well as taught to all staff, including cleaners, who

leave access to the computer area.

Escape routes and fire notices should be clearly and prominently displayed. With all possible steps having been taken to ensure fire prevention and the various methods available to deal with it, its occurrence through some electrical fault or other malfunction of the system is always a possibility. The most important factor in combating fires from this type of cause is early warning.

Almost any fire in its incipient stage is quite easy to deal with, confining the damage to the immediate area of the cause. But by the time the fire becomes detectable to the human senses it is often too late for simple measures and a serious configuration has already started. Automatic early warning detection systems should, therefore, be regarded as essential equipment in the computer suite, the most commonly recommended being those employing ionisation type products-of-combustion detectors. These are the most sensitive detectors available, responding to very small concentrations of smoke particles in the atmosphere.

In this type of early warning system, groups of smoke detectors are connected in simple two-wire circuits to a control unit, which activates audible alarms, automatically initiates computer shut-down and switches off other machinery, including air conditioning. In some cases the controller also activates automatic extinguisher equipment. Each group of detectors covers a particular "zone", and control units are normally available with capacities ranging from one to 20 zones, all multiple-zone units being furnished with panel displays indicating the zones of any detectors going into the alarm condition.

In the main rooms of the computer suite, air which carries smoke particles is likely to be slightly above the ambient temperature, so that the highest concentration of these particles would be close to the ceiling. Detectors covering these rooms, therefore, should be ceiling mounted at intervals recommended by the manufacturer. However, electrical wiring in the floor and ceiling voids is a potential fire source, and detectors mounted in these voids are essential if the early warning system is to be regarded as comprehensive.

Nor should the air conditioning plant be overlooked,

for it can be one of the most effective means of spreading flames or hot gases through a building.

The presence of smoke particles in the air conditioning duct is an obvious danger signal, and their detection can enable trained staff to locate an incipient fire rapidly. Smoke detectors are available mounted in special probe units for fitting to the side of the duct. With these units the air passing the duct is continuously sampled, and if the smoke particle concentration reaches the danger level this is immediately detected and the alarm triggered.

With its valuable material content, every computer suite should be protected by an automatic extinguisher installation. Even when the building is fully staffed it may not be possible for trained personnel to respond to an alarm in time to prevent a fire developing, especially if poisonous fumes, produced by combustion of plastic materials, prevent entry to the suite. And it must be remembered that, although the fire hazard is reduced when the computer system is not in use, the risk does not disappear altogether. For example, if an electrical fault during the night when the computer rooms are unoccupied.

In the opinion of most experts, high pressure carbon dioxide (similar gas) extinguisher systems are generally recommended for computer protection. This method is preferred to sprinkler systems for a number of reasons. The gas can easily be injected under high pressure into floor and ceiling voids and causes no damage to the electronic equipment. On the other hand, although it is not toxic when mixed with air, it would obviously cause asphyxiation when present in sufficient concentration to prevent combustion.

Automatic safeguards are, therefore, essential to ensure that personnel are evacuated before the gas is released. Extinguisher control systems are so designed that alarms are required to activate their circuits, thus preventing response to false alarms; and a fixed delay between electrical activation and the gas discharge allows time for personnel to leave the danger area.

Further safeguards are also provided, such as inhibition of the discharge until doors are closed on an external switch operated.

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Crossword compiling puzzles the programmer

CROSSWORD puzzles, as we know them, are a recent development which, in Britain, have reached a level of great sophistication. The roots of these puzzles lie in the anagrams, acrostics and word-squares which provided much intellectual activity in previous civilisations.

Pythagoras and later Plato and their followers studied and recorded anagrams which became a fashionable Roman pastime. Later classical scholars rediscovered these puzzles and introduced them to medieval Europe. The Jewish Kabbalists, amongst others, sought mystic significance in the possible rearrangements of the letters of a person's name.

Acrostics are very common in Hebrew poetry and several Psalms — 25, 34 and 119 — are so

derived from the word-square with clues. The first crossword puzzle was published in the US in 1913. It was devised by a journalist Arthur Wynne who emigrated from Liverpool and on arrival in New York persuaded the Editor of the New York World to publish some simple puzzles in its Sunday Supplement "Fun".

These continued without rivals for some ten years until Robert Simon and Lincoln Schuster published a book of 50 simple crosswords. Three-quarters of a million copies were sold in the first few weeks, establishing the popularity of the crossword puzzle in the States.

Arthur Wynne offered some of his puzzles to C. W. Shepherd of News-papers Features who purchased six. The first crossword to be published in Britain was devised by Arthur

Wynne and was absolutely and literally correct. It is only in Britain that the cryptic crossword is so extensively developed, a sample clue being "She was his own invention (5, 7)".

On the Continent, the definition-type crossword is universal; the brief clues are often printed in the blanked-out squares with arrows to indicate the direction of the answer. French and Swiss crosswords are numbered in Arabic numerals across the top and Roman numerals down the side.

American crosswords are usually much larger (25 x 25) and are so designed that all letters are cross-checked by intersecting words.

The largest crossword ever published is one with 7,748 clues and 25,000 squares compiled in eight years by the Belgian Henri Rhaese.

An experienced (human) crossword compiler will take some eight to ten hours to produce a full-sized cryptic crossword. The creative skill of the compiler lies in the composition of the clues, but the setting up of the word pattern within the diagram is a formidable and time-consuming task. Since this is largely a repetitive task of identifying words and phrases of the correct letter-positions, it has been considered suitable for computerisation.

F International was recently asked to evaluate the economic feasibility of crossword creation by computer. Our librarian used ILE's Inspec, and also advertised in Computer Weekly asking for references.

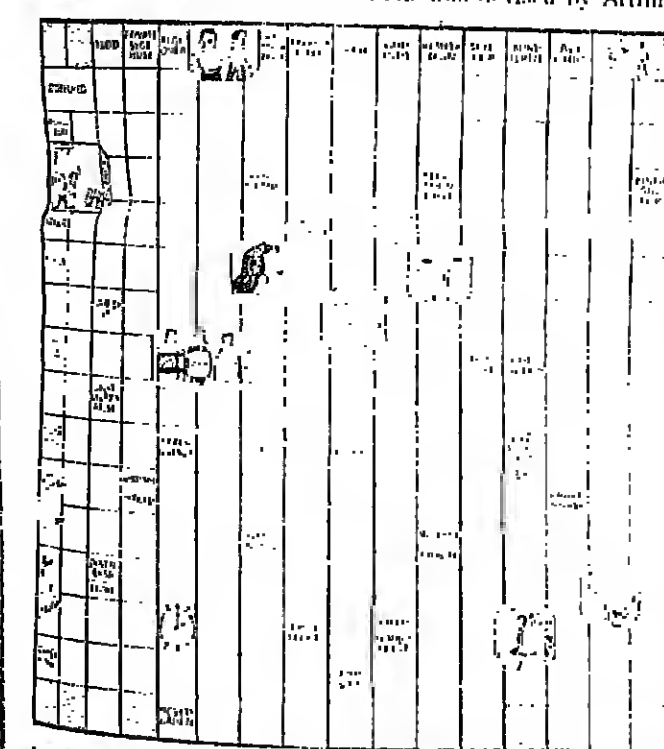
I should like to take this opportunity of publicly thanking Computer Weekly readers who responded — one even with the program ready punched.

Only two programs were identified which could produce crosswords; and in both cases the solutions were trivial.

A paper by O. Feger describes a program which inserts whole words into a puzzle. The user specifies the puzzle pattern comprising the shape and distribution of letter-filled and blanked squares together with the first word to be inserted. The first part of the paper discusses the algorithms defining the word positions and their inter-relationships. Nine arithmetic values are derived for each square and these control the design process. The second part defines the search and fit algorithms which search the word-list for words of suitable structure. These are then listed and used in turn in the puzzle until completion or a dead-end results.

The program runs on a Telefunken TR4 computer. Using a word-list of some 10,000 3 to 8 letter words, small puzzles (8 x 10 boxes) can be produced in a few minutes. Larger puzzles (30 x 10 boxes) can be produced but the results are not suitable for competition crosswords.

I. J. Mazlick describes techniques to construct a puzzle letter by letter. The decision to



In this Danish crossword, clues as the form of pictures or words are printed in the blanked-out squares.

Wynne that the initial letter of each line corresponds to the letters of the Hebrew alphabet. A remarkable word-square

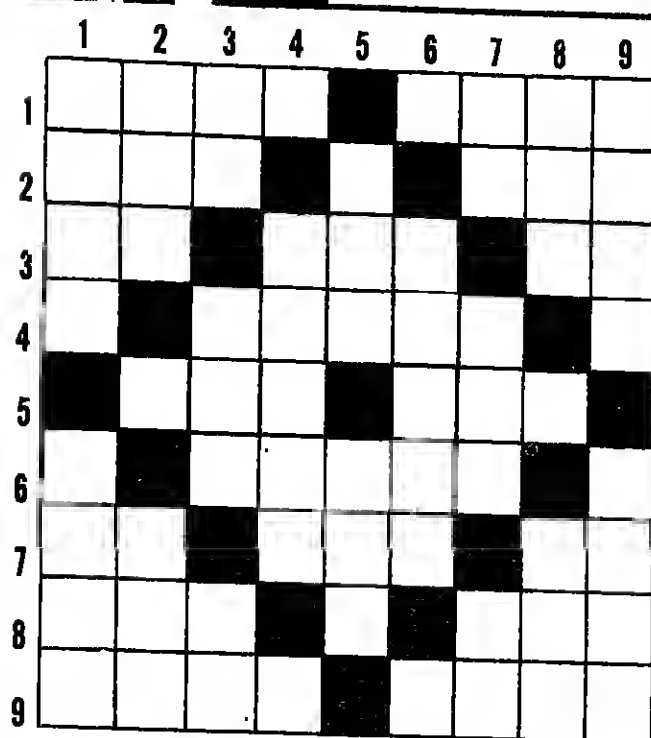
was found on a piece of wall-plaster at Cirencester. The five words can be read horizontally from left to right in descending rows and from right to left in ascending rows. Also, it can be read vertically downwards from right-hand column across to left-hand column and vertically upwards from right-hand column to left-hand column.

More unusual, the words also form a sentence which may be translated as: "The sower Arjeto controls the wheels with an axle." The piece of plaster can be seen at Cirencester Museum.

The first crossword puzzle appeared in England during the 19th century; these were of an elementary kind devised from the word-square with clues. The first crossword puzzle was published in the US in 1913. It was devised by a journalist Arthur Wynne who emigrated from Liverpool and on arrival in New York persuaded the Editor of the New York World to publish some simple puzzles in its Sunday Supplement "Fun".

by Judy Cox

SINCE its invention in the 1920s the crossword puzzle has become so popular that attempts have been made to write computer programs to compose the puzzles. Judy Cox, a business analyst with F International, was involved in the company's feasibility study on the subject, and describes the findings here.



In this crossword, most of the letters are cross-checked by intersecting words.

insert a letter is based on the probability of its occurrence at the relevant position in a word contained in a list of possible words. This probability is assessed from statistics associated with a word-list. The priority in which a letter space is

filled is dependent on the number of adjacent spaces and the lengths of the words in which it is contained.

Mazlick's program was run on an IBM 370/155 and puzzles were produced up to a size of 13 x 13 containing words of two to

four letters from a list of 2,000 such words. Computing times for these solutions were about five minutes.

Neither of these two main studies produced a crossword suitable for publication as a puzzle. In both cases the computing time when attempting this was prohibitive. It is a difficult task to define the algorithms required to sequence and identify the interlocking words and to set up and structure a suitable vocabulary.

Our studies also bordered on the areas of crossword solution and the compilation of clues, but these were not part of the project brief. In addition, our study revealed another reference which was not pursued. This was H. Rhaese's Information and Control (Vol 6, p.300, 1963) on "3D crossword puzzles in Hebrew".

F International's advice was, therefore, that there was no commercial justification for using a computer to create crosswords. In part, the economics rested on the incredibly low fees paid to human compilers, most of whom seem to be retired gentlemen exercising their unusual skills more for fun than gain.

Nevertheless, a commission for the computer compilation of crosswords is known to have been placed, though the cost and results of this are not yet known.

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THE UK Public Sector is a vitally important market for our office systems firms to capture if they are to prosper, but spending cuts, red tape, and union restrictions are all obstructing the automation of local government.

Frank Jones, a management services officer with Bradford Metropolitan Council and a pioneer in the introduction of large shared logic word processors to the Public Sector, describes how councillors are being caught between the devil of union militancy and the deep blue sea of government cut-backs.

How word processing could help councils to beat cuts crisis

By Frank Jones

THE clouds are beginning to blot out the futuristic rays of the office automation future for the United Kingdom.

The hopes of the previous and present governments were that North Sea oil would allow the UK to develop new products and markets whilst in economic decline.

Because of cheap Third World labour, high technology was one of the few areas where we remained competitive internationally. Office automation with its silicon chip and software reliance has certainly become one of the largest single technological development areas and one of the most attractive for exports.

It was hoped large scale public and private sector investment in office automation would attract investment in manufacture and software development within the UK as at least a proportion of the sales for investors would then be local. However, a number of factors are conspiring to thwart our salvation.

The trade unions are mustering their members not to prevent the introduction of office automation, but certainly to make it difficult, less cost effective and protected.

One could argue, perhaps justifiably, it was their job to protect their members and they were only exercising their prerogative.

The cataclysmic results of the difficulties they could create by irresponsible action, however, can clearly be demonstrated by the Swiss watch industry. They ignored investment, remained undeterred by technological development and the end results were the collapse of the industry as the US and Japan attracted their customers with new microprocessor based products.

But trade unions are only one contributory factor to an aborted future.

The government, gifted though it may be in stimulating confidence for our economic salvation by trying to reduce

public expenditure, may, in my personal view, be counter-productive following its proposed reductions in the rate support grant for local authorities.

Normally, the grant has few strings attached to it so local authorities with reduced grants can economise in any way they see fit.

The recent Department of the Environment circular indicated a £300 million reduction from the £900 million grant with future possible reductions if higher pay is awarded to workers.

The intention is clear: reduce staff, increase efficiency and spend less money for the same or an improved service.

But can or will local authorities get the message? I think not.

If we take Bradford Metropolitan Council, for example, approximately 50% of income of the £183 million gathered was the rate support grant for 1979/80. More significantly, 74% (or £80 million of £112 million) was net expenditure.

The intention to reduce by, say, 3.5% of the £80 million means that approximately £3 million will need to be trimmed off the budget this year.

If we took a national cost of £1,000 per employee, the council would have to reduce by 1,000 jobs to achieve their saving.

Any guesses what the trade union reaction would be of, say, Nalgi, which has 4,000 members in Bradford, was asked to reduce the labour force by 25% overnight with no increased benefits to members?

So, as a politician seeking re-election next time, these are your options: increase rates and probably lose the election; reduce dramatically staff and services and probably lose the next election; reduce staff dramatically and by introducing office automation maintain service but anger the unions by the speed of change; or, reduce your capital expenditure, injure long term efficiency but hope to stay in power to retrieve the situation.

It is a brave man who chooses anything other than the latter of these courses. So with a declining capital expenditure and a growing proportion of revenue expenditure what happens?

The current pattern of 83% spent on wages and running expenses and 17% spent in capital expenditure — with a 30% reduction — in little more than five years would leave no capital expenditure and committed revenue to personnel.

As the major employer (the public sector) was not investing in technology in the office there would be little point in venture capital companies investing in factories in the UK to attract local sales.

So what would happen — is what has already happened — the US would have Third World countries assemble their products cheaply and they would then export them to our more adventurous private sector companies.

Eventually, in the sixth or seventh year, councils would have to start reducing services by sacking staff and as the com-

munity did not have any new forms of employment further demands on the public purse would be made.

A Catch 22 decline would have been entered into.

But surely, you may argue, officers would advise politicians against such a course of action. I wonder?

Most local authorities, following the Bains Report, built strong personnel sections who introduced job evaluation schemes. The schemes themselves were an attempt to rationalise the grading of personnel in the organisation. A laudable objective in itself.

Nearly all the schemes were on some form of points rating relating to a number of characteristics to the duties in the post.

For example, a manager having responsibility for 40 solicitors would receive points for the number of employees and the complexity of the task performed. Nowhere in the scheme does it attempt to measure if the solicitors are effective or if the person is suitable to the post. Almost with naive pride, personnel officers inform us it is not the person but the post that matters.

So, along comes office automation. A series of programs are written for a microprocessor system which eliminates the work of 38 solicitors.

Two clerks replace the other two solicitors and now only the very difficult un-programmable decisions are referred to the manager.

Your personnel officer

How many companies would even contemplate investing in an office automation industry... where there is a positive disincentive to politicians and managers.

revalues the post and, because the manager has less staff to manage and they are less skilled, he is down-graded.

The fact he was a genius and redesigned the organisation to meet his employer's objectives is only a personal factor and not attributable to the post. Would you recommend office automation in these circumstances as a local authority manager?

A far fetched scenario? The microprocessor has been with us since 1971. How many office products are driven by a UK microprocessor. None. The only microprocessor made in the UK is the Ferranti F100L used mainly for defence projects.

How many companies would even contemplate investing in an office automation industry in the UK where there is a positive disincentive to politicians and managers?

So how can Mrs Thatcher's government reverse the trend?

I attach strings to all reductions such as: reductions must be by increased efficiency, by reductions in unnecessary administrative staff and sales of administrative buildings to meet reductions will result in further cut backs.

1. Insist all public bodies to review their job evaluation schemes to establish cost centres for personal achievement and reductions in manpower whilst meeting objectives means a higher but lower grade.

2. Provide the unions with a rational deal for accepting office automation: provide grants for councils to entry staff for, say, a year in order that they may be retrained; provide unions with retraining centres with government sponsored courses in information based technology; reduce the retirement age for men to 60 in each public sector that accepts office automation; reduce the working week to 36 hours; increase the holidays of staff in line with other EEC countries; set levels of change full automation over five years with government backed employment safeguards; create new information jobs in public sectors (then market your products); expand our educational system with more subsidised for mature students; sandwich courses for middle managers over 30 and retraining for staff who find themselves in the wrong jobs (with security of a job after training); and make it more attractive to two parent families for only one to work part-time (after tax system to take into account the number of hours people work).

3. Help UK based office products: set a 25% grant for installing any UK manufactured microprocessor based product; make all microprocessor based products VAT zero rated; and, ignore the regionalisation grant system and provide grants to anybody who will build office products in the UK for, say, two years.

4. Encourage public sector employers to use office products by: making Chief Executives accountable for the five year office automation programme; fire any Chief Executive who does not meet minimum office automation objectives; increase pay to Chief Executives who exceed minimum office automation objectives; and, provide assistance to public sector employers to hire consultants to evaluate office automation potential, provide assistance in implementation and train staff.

You might well be asking yourself, with such drastic measures, do I believe Mr Thatcher will adopt them and save our automated future. The answer is, maybe.

I certainly believe she is more likely to tackle the root problem than the previous government. You never know, she may give me a ring tomorrow — rather than set up another working party.

Do I deny?

DESPITE doubts expressed by the electronics industry about the various government support schemes for microelectronics, a Department of Industry spokesman said last week that they were all operating "extremely well and going like a bomb".

The well and going like a bomb double comes from the impending government review of expenditure in this area.

125 Megabyte and Datapoint 8374 drives.

Nashua Computer Products (CW), Cory House, The Ring, Bracknell, Berkshire, Tel: 0344 88711.

Three versions of the 4442 are available: 10 Megabyte,

the specification of the printer is 184 columns at 10 characters per inch 200 cps printing, tractor feed and vertical format control. Prices are from £8,800.

The Dacell Group (CW), Dacell House, Gardens Lane, Baiting, West Lothian, Tel: 0590 58565.

The functions of the keyboard can be easily changed to gain access to a total of 130 pre-programmed mathematical and scientific functions or a combination of these and personal routines programmed by the user.

Other features include an alphanumeric keyboard capable of communicating with the user, and a continuous memory expands the HP-41C data. Software supported combined with the user definable keyboard and memory expands the HP-41C into a system as powerful as some small computers.

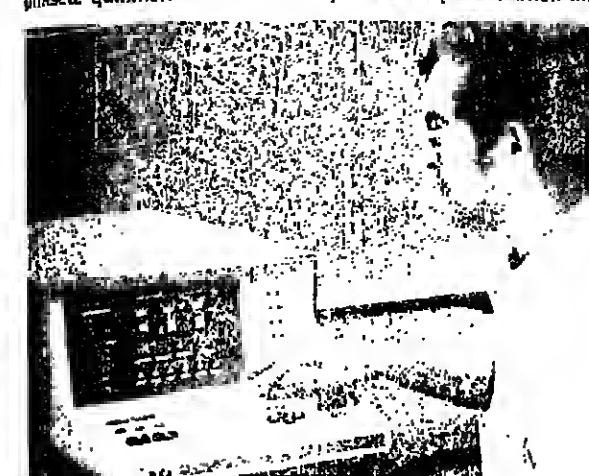
The HP-41C will be available in the UK from September, and prices are from £135 for a card reader, and £280 for a printer.

Hewlett Packard Ltd (CW), King Street Lane, Wokingham, Berkshire, Tel: Wokingham 784774.

PRODUCT NOTES

General purpose analyser from Hewlett Packard

A GENERAL purpose analyser is now available from Hewlett Packard, for the design of digital systems. Called Model 1610B, it is a logic state, keyboard controlled analyser, and features include multi-qualified clocks for analysis of multiplexed buses.



Low cost 225 chps printer

COMPRINT's Model 912 is designed to meet the need for low cost printers in small business systems. Home computers and message networks. The unit writes 80 column lines at a speed of 225 lines per minute. The print medium is a unique 9 x 12 pinhead matrix.

that generates overlapping dots to create more fully formed characters. A full six month warranty is offered on the Model 912, and the unit is automatically tested and fully checked before shipment.

Computers Printers International (CW), 280 Polaris Street, Mountain View, California, 94043 USA.

Harris (CW), Data Communications Division, 11001 Dallas Parkway, PO Box 00010, Dallas, Texas, USA.

Webster Data Processing Services Ltd (CW), 58 Wilmore Road, Bromley, Kent, Tel: 01-461 8011.

For ICL users

USERS of ICL XOM communications protocol can now have remote printers in excess of the 132 columns with limit. These units are applied by Dacell, and can be intelligent terminals or keyboard printers with paper tape reader and punch. The intelligent terminals are supplied with VDUs and floppy discs.

The specification of the printer is 184 columns at 10 characters per inch 200 cps printing, tractor feed and vertical format control. Prices are from £8,800.

The Dacell Group (CW), Dacell House, Gardens Lane, Baiting, West Lothian, Tel: 0590 58565.

Nashua discs

NASHUA has announced a range of hard disc cartridges for loading drives featuring 0.875 inch disc. Using 908 cylinders, the cartridges are certified at 4,400 bits per inch and 200 tracks per inch.

Known as the Nashua Model 4442 series, the discs have a magnetic ferric oxide coating with oriented particles and Nashua's coating formulation. Datasheet. The discs are protected by a heat seal which prevents the disc from being used without interfering with read/write characteristics.

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the 1000 conditions are not set or a system clock fails.

Data can be stored into the 1610B with either or both edges of each of the three clocks. The slave clock stores data into holding registers and the master clock stores all data into holding registers.

Another function is a memory retrieval mode, which gives access to the contents of the analyser memory even if a trace point has been generated as in the case of a system clock failure.

For hard copy record of tests and formal trace specifications, the HP-1610B includes an output that is compatible with the company's 8080A and 8080B thermal printers. Both produce page-width prints and simple plots at 240 lines per minute.

Hewlett Packard Limited (CW), King Street Lane, Wokingham, Berkshire, Tel: 0734 784771.

national (CW), 280 Polaris Street, Mountain View, California, 94043 USA.

Computers Printers International (CW), 280 Polaris Street, Mountain View, California, 94043 USA.

THE latest addition to the PCA Minicore range is the wall hanging Compack, which incorporates an easy to read clock face and twin high grade precision instruments recording temperature and humidity.

The clock is battery powered and requires no electrical installation. Fitted with a quartz movement ensuring accuracy, it will give up to two years service on a single long life battery.

It costs £36.99, including VAT.

PCA Data Processing Accessories Ltd (CW), 15 Greyhound Place, London, SW1, Tel: 01-222 0222.

Webster Data Processing Services Ltd (CW), 58 Wilmore Road, Bromley, Kent, Tel: 01-461 8011.

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FOUR video training modules on time sharing option have been released by Electronics McGraw-Hill, the first in an overall TSO training series for applications programmers and data processing managers. TSO is a software package designed to improve programmer productivity by providing a simple conversational technique for managing data sets.

The modules cover the functions of TSO and relate them to specific parts of the operating systems. The naming and referencing of data sets and descriptions of the creation and modification of data sets using the EDIT command.

Editors/ McGraw-Hill (CW), 95 Corporate Woods, 9300 West 110th Street, Overland Park, Kansas 66210, USA.

It is available with sheet widths of 2mm, 4mm and 6mm. Fully automatic in operation, the Sentinel machine head is fully guaranteed for two years. It costs £225, plus VAT.

Business Aids (CW), 3 Wilbury Avenue, London, NW10.

working storage. It is capable of communicating with a host computer in either batch or interactive mode. It supports up to 64000 lines of character edit features in single backspace and delete mode and stop.

Zygol Dynamics, Bank Chambers, 12 High Street, Chesham, Bucks. Tel: Chesham 72681.

THE Minimate from Zygol Dynamics provides the same storage capacity as Datamate, the device's minimate system in the range, the BS 2320, compatible minifloppy disc storage and edit terminal is designed as an attachment to CRT or hard copy terminals to handle data applications.

The Minimate provides over 71,000 characters of

will display 35 lines at 80 characters. It includes text underline, blink and insert facilities in any combination. Any character can be protected.

A graphics function is possible and the system also provides line and page erase, addressable cursor and for the display of all control codes as well as a unique function which can be used to return the cursor to the position it was in before use of the

The BH 721's 12 inch CRT

signal conditioning.

Base Ten can provide a data-analysis system incorporating a DEC PDP-11 series minicomputer with peripherals and software. Alternatively, a telemetry link can be used in the vehicle with the receiving equipment installed at the data analysis station, to allow on-line analysis of the experimental data.

Base Ten Systems (CW), 12 Elmor Road, Farnborough, Hants.

FEEDBACK has launched a low cost telephone answering ancillary that records and displays the telephone numbers of callers to unattended telephones.

Using microprocessors, the unit can sit in front of a standard telephone receiver. It measures 237mm x 65mm x 27mm yet it can store 10 ten digit numbers.

When a caller telephones, Logatel automatically answers and gives a distinctive tone if the caller number is unattended. The caller then dials his own number and it is logged in Logatel's memory.

By simply touching a switch, the recorded telephone numbers are displayed one after the other when the person returns to his desk. The Logatel unit connects directly to the standard telephone equipment.

Feedback Ltd (CW), Park Road, Croyborough, Sussex, Tel: 0293 21222.

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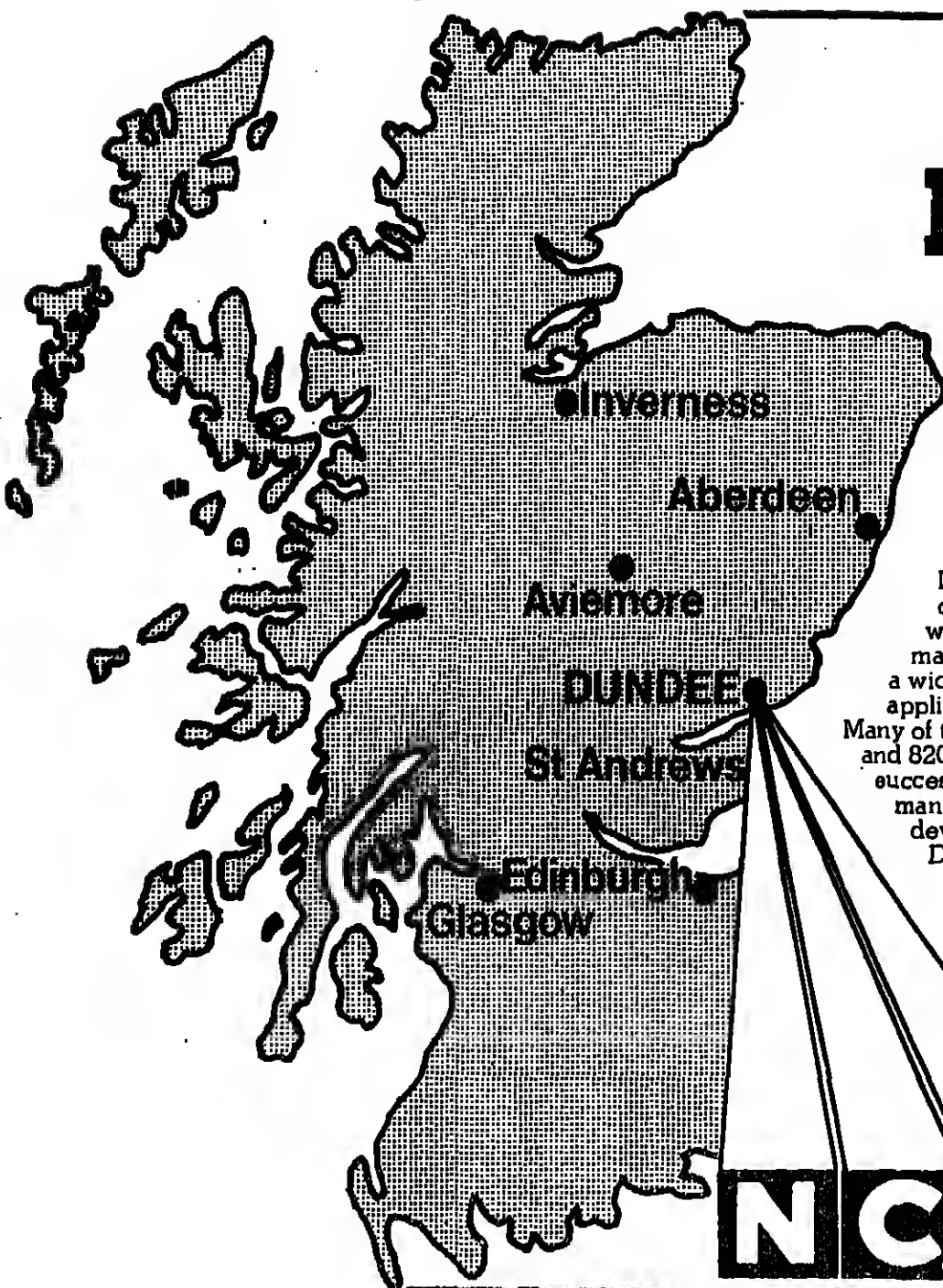
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- providing technical support related to database performance, data security and integrity and other related functions necessary for good control of a database environment

Currently there is a major project introducing the first database into one of Spillers' largest operating companies.

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Plans are now being laid to develop masterplans for the development of systems in all operating companies, making use of database and mini-computer technology.

Applicants for this position should possess:

A good knowledge of database design practice, both logical and physical, including broad experience in techniques - practical database experience as a programmer or analyst of at least one major application - at least 7 years overall D.P. experience covering both systems and programming, and a good appreciation of business systems.

Telephone for further details and an application form or write with full career and salary history to:

Amber Bridger, Spillers Limited,
7-15 Lansdowne Road, Croydon, CR9 2JG.
Telephone: 01-686 4393.

Spillers
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LONDON BOROUGH OF HOUNSLOW BOROUGH TREASURER'S DEPARTMENT SYSTEMS PROGRAMMER

Salary scale £5541-£5868 inclusive

A vacancy arises in a busy Local Authority installation. IBM 370/138 running under DOS/VS, POWER/VS and related software BAL experience is necessary. Must develop/maintain various terminals and telephones running under CICS/VS.

For further information about the post ring Mr. A. Ramsay Tel: 01-670 7728 ext. 3125. Applications to Mr. F. Reeves, Data Processing Manager, Computer Suite, Civic Centre, Lampton Road, Hounslow, TW3 4DN. Closing date: 14 September, 1979.

ROYAL COLLEGE OF PHYSICIANS
REGENT'S PARK, LONDON

PROGRAMMER— BASIC

circa £5,000

The College is about to install a computer system for examinations administration and related functions. The system will be based on a PDP 11/34 configuration with terminals and word processing facilities.

Applicants are invited from BASIC programming interested in working with a small team in a College environment.

Working hours could be adjusted to suit applicants with domestic commitments.

Applications, with full details of experience and qualifications, should be sent to: The Deputy Secretary, Royal College of Physicians, 81, Andrew's Place, Regents Park, London NW1 4LE.

Derby Lonsdale College
of Higher Education

Programmer/ Analyst

(Full-time or
Part-time)

to work on SYSTIME 8000 and SYSTIME 1000 computing systems operating under RSTS/E and RT-11.

Salary scale
Full-time
£4644-£5067
Part-time
£2.40 per hour

Application forms and further particulars may be obtained from the Stalling Officer, Derby Lonsdale College of Higher Education, Kedleston Road, Derby DE3 1GB (Telephone Derby 471811) to whom completed forms should be returned by 17th September, 1979.

THE OPEN UNIVERSITY
DATA PROCESSING DIVISION

SENIOR COMPUTER OPERATOR

Up to £4,300
(including three-shift allowances)

The University's rapidly expanding Data Centre which has recently upgraded to a Univac 1100/80 system, has a requirement for a Senior Computer Operator who, together with the Shift Leader, will supervise two other operators on one of the three shifts.

The University's policy of being at the forefront of hardware and software technology makes this an interesting and desirable position in which to work.

We can offer:

- Career development opportunities
- Training, including day release for computer studies
- Good holidays - 4 weeks plus a week of Christmas and Easter
- Sports/social facilities

Applications are invited from persons who have gained the SC (Shift) and who have over two years' operating experience of Univac 1100 systems.

Application forms are available from: The Recruitment Officer, (JD271/3), The Open University, P.O. Box 26, Milton Keynes MK7 6AL, or telephone Milton Keynes 63484. There is a 24-hour answering service on 03685 11111. Closing date for applications: 13th September.

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20 UPPER FITZWILLIAM STREET
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WINALOT,
BONIO,
KENNOMEAT,

Spillers Ltd

Royal Observatory, Edinburgh

Software Specialists

Scientific Officers/ Higher Scientific Officers

There are vacancies for software specialists at the Royal Observatory, Edinburgh.

The Observatory is responsible for three major national facilities - the 1.2m Schmidt telescope in Australia, the COSMOS high-speed measuring machine at Edinburgh and the 3.9m infrared telescope in Hawaii. All facilities employ software specialists for developing control system software (for controlling telescopes, telescope instrumentation and high-speed measuring machine) and for developing scientific applications software for the reduction and analysis of data.

Initially, the successful applicants will be posted to the UK Infrared Telescope Unit. This 3.9m telescope is the largest of its kind in the world. The telescope and the ancillary instrumentation are controlled by two PDP 11/10 computers. The successful applicants will be responsible for the support and development of the telescope operating system, written in assembler, and the instrument control systems, written in higher level languages.

Applicants for these posts should have experience in one or more of the following fields: assembler language programming, FORTRAN, real-time software, and scientific applications packages or microprocessor systems. A good degree in Mathematics, the Physical Sciences or Computer Science is essential.

Because the telescope is situated at high altitude a special medical examination is given to all members of the UKIRT operating team on Hawaii. Success in that examination will be a prerequisite for appointment to this post.

Salary will be in the range £4218-£6211 (under review) depending upon age and experience. Non-contributory superannuation scheme.



Application forms and further details from: Personnel Officer, Royal Observatory, Blackford Hill, Edinburgh, EH9 3HJ. Tel: 031-987 3321. CLOSING DATE: 21 SEPTEMBER, 1979.

Public Health Laboratory Service

Team Leader

£7506-£9030 + £354 London Weighting
and from 1 January 1980

£8387-£10304 + £354 London Weighting

The Public Health Laboratory Service is currently using computer technology to improve the efficiency of its present and future applications of data processing. The service is currently using a number of different computer systems and is looking for a Team Leader to control and develop out newly formed Data Processing Unit.

We provide a microbiological service in some 60 laboratories throughout England and Wales and are also responsible for two major research establishments in Porton Down, Wiltshire, and Colindale, North London.

As Team Leader you will essentially be bringing under centralized control those computer projects already operating together with those planned for the future. Towards this end a CIL computer has already been installed at Porton Down in connection with the Data Processing Unit.

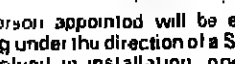
Your responsibilities for the existing operations and resources and the development of the unit will cover the full range of staffing, systems and financial control.

You will be based with the Data Processing Unit in pleasant surroundings in Colindale, NW9, though your work will involve occasional travel throughout the country.

There are high and postulating considerable challenges and the scope to apply your extensive experience in the control of an existing team project.

Naturally you will need to be well qualified technically and possess the managerial and personal qualities necessary to make this venture a success.

Further details of the post may be obtained from Dr. R. A. Bassett, Public Health Laboratory Service (Health), 61 Colindale Avenue, London NW9 5EQ (Telephone 01-200 1295) to whom an application together with the names and addresses of two referees should be submitted by 20th September, 1979.



MERSEYSIDE COUNTY COUNCIL

TECHNICIAN

(COMPUTER MAINTENANCE)

(£3,585-£4,533 p.a.)

The person appointed will be a member of a team of four working under the direction of a Senior Technician. He/she will be involved in installation, operation and maintenance of various computers, closed circuit television cameras/monitors and ancillary electronic equipment.

The post involves shift work providing coverage from 0700 to 1900 hours, Monday to Friday (two shift system), for which a shift allowance of 12.5% is payable.

Applicants should have experience in digital techniques and/or video systems and preferably qualified to O.N.C./City and Guilds in Electronics.

Application forms, returnable by 17th September, 1979, from the County Engineer, 4th Floor, Steers House, Canning Place, Liverpool L1 8JW. (Tel. 051-227 8234, ext. 2512).

Please quote ref. no. TR/540 in all correspondence.

ANALYST/PROGRAMMER

to £6000

2 yrs analysis financial-commercial exp. Northampton Rd 8/101.

ANALYST/PROGRAMMER

to £8000

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SYSTEMS ANALYST

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ANALYST

to £7400

2/3 yrs commercial exp., Peterborough Rd 8/99B.

TEAM LEADER

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Extensive commercial project exp., Peterborough Rd 8/99C.

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OCS/VS to implement new systems, Peterborough Rd 8/99D.

OPERATOR

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SYSTEMS/ACCOUNTS

MANAGER

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The successful candidate, either male or female, will have an accounting background and several years practical experience in the design and implementation of both manual and computerised systems. A substantial salary plus a car is envisaged. Five life insurance and a contributory pension scheme and four weeks holiday are provided after a qualifying period.

For an application form, please write or phone Mrs. Janet Betterman, A.C.C.A.,

Derling & Wood (Television) Limited,

56 Cherry Hinton Road, Cambridge.

Telephone: Cambridge (0223) 46005.

City of Nottingham

City Treasury

Senior Systems Analysts/

Cost Accountants (2 Posts)

P.O.1(2) £6,447-£7,125 p.a.

The City Council operate a central ICL 2980 installation servicing all departments together with expanding on-line facilities.

The above posts form part of a small team with full responsibility for the introduction and development of new costing, payroll and management information systems.

Applicants (male or female) should be able to liaise with all levels of management and have a sound background in systems design and development. Previous experience of payroll/costing applications would be advantageous.

Computer Operator

(Male or Female)

Teach. £1/2 £1,908-£3,993 p.a. (plus 14% shift allowance)

Required to work a 2-shift, 37-hour week system. One shift leader and 2 operators men each shift.

The current ICL 1903A computer is being replaced by an ICL 2960 computer in September for which training courses are being arranged.

Starting salary within the range according to age, experience and qualifications.

Applications, with names of two referees, should be submitted to the City Treasurer, The Guildhall, Burton Street, Nottingham NG1 2DE. Closing date for applications: September 12, 1979.

PROGRAMMERS

(Starting up to £5,600)

We need Programmers with at least one or two years' experience to implement the systems planned for our new ICL 2950 installation.

Cobol knowledge would be useful, but not essential. We are prepared to retrain experienced people.

You will find the immediate tasks very rewarding and promotion opportunities outstanding.

If you are interested in these vacancies, either write to:

Mr. L. T. Richerds, Halfords Limited
Ickniald Street Drive, Washford West
Radditch, Worcs. B98 0DE

or just call in to see us for an informal discussion (no appointment needed) at either of the following:

Halfords, Radditch
Tuesday, 4th September
from 5 p.m.-8 p.m.

Holiday Inn, Birmingham
Thursday, 6th September
5 p.m.-9 p.m.

HALFORDS

A BURMAH GROUP COMPANY

DIRECTOR EUROPEAN SALES

Dublin Five Figure Negotiable

Our client is a major North American company in customised Intelligent Data Terminals and related equipment. They are currently setting up their European manufacturing and marketing base in Dublin.

They wish to recruit a Director of European Sales capable of expanding their current O.E.M. sales and of developing the end user market. The candidate will ideally have several years' experience in the European market in related equipment. Engineering degree or equivalent preferred. French/German an advantage but not a prerequisite. He/she will recruit and develop his/her own staff.

Compensation will be in the live figure range with appropriate fringes, plus incentive and relocation. Initial interviews will take place in Dublin and London in early September.

Send C.V. to:

J. F. Kenny,
J. B. Management Ltd.,
20/21 South William Street,
Dublin 2.
Phone: 01-710242.
Telex: 852-31796.

J.B. MANAGEMENT LTD.
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Ring David Abbey for further details on 01-261 8016

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Ring Terry Bate on 01-637 9611 for further details

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JBA

Consultancy Divisional Manager

Central London neg. over £15,000

One of this country's foremost consultancy organisations, specialising in data processing and T.P. project and consultancy work, has an opportunity for a senior consultant with significant managerial, marketing and technical experience to start up a new division within the company. It is envisaged that the project work to be carried out by the new division will be naturally and logically connected with the company's current main activities, so ideally candidates should have experience in d.b. p. net-working, distributed processing etc. systems and projects. A substantial salary is on offer, plus a profit share scheme based on results and a company share scheme. Superb opportunity for a top flight professional. Contact: Andy Wright

Systems S/W Support

Middlesex base/Europe Package £9,000 + Car
We have been retained by Westinghouse Management Systems to recruit an IBM software specialist in a sales orientated environment. The company develops and markets advanced systems S/W packages and are about to launch three new OS products to supplement their existing range, currently being used by around 2800 sites in the U.K. and Europe. Ideally, applicants should be under 30 years old, be fully experienced in VSAM, ISAM and CICS or, at least, be totally into VS1/VS2 type software. This job will involve full support activities with total responsibility for one product. Travel to European sites will be expected and occasional training trips will also occur. Superb opportunity for a mobile, communicative software person - excellent prospects. Contact: Mike Cresswell

Designers - Industrial Systems

Berkshire c. £7,000
A large well-known manufacturer has opportunities for Systems Designers to work on the development of real-time industrial systems, using mini and micro-computers. Applicants must have at least four years experience in design and programming of automation, military or process control systems and should be familiar with a real-time language such as CORAL or RTL/2. Salaries are negotiable according to experience. Large company benefits including an excellent relocation package. Contact: Jim Baker

For further information on any of the above vacancies, please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway. JAMES BAKER ASSOCIATES, International Personnel Consultants, 32 Savile Row, London W1. Tel: 01-439 9311.

Project Manager

City up to £9,500 + mortgage
Our client, a major international corporate bank with many EDP systems, which are either under development or in use, is seeking to appoint an experienced individual to help maintain the high standards required in its London office. As a senior member of a small team, you will be expected to make a significant contribution to both development and maintenance of new business applications. Applicants must be well educated and should possess two years' project leading experience ideally gained in a financial environment, while a sound knowledge of RPGII (Sys 3) is mandatory. In addition to the competitive salary, the bank provides a comprehensive range of benefits, including low-interest mortgage facilities, non-contributory pension, life and medical insurance plans and an interest free season ticket loan. Contact: Margaret Stevens

Sales Executive

Midlands and North up to £7,000 p.a. + Commission + Co. Car
A small mini-computer systems company, with an impressive growth record, requires a sales executive to expand its business in the Midlands and North of England. The successful applicant will have complete responsibility for selling computer hardware and standard or customised software and will report direct to the Managing Director. Candidates should have several years' experience in the computer industry at either a sales or a technical level. Selection will be based on personality coupled with the ambition to succeed in selling. A challenging ground floor sales opportunity with lots of scope for an achiever. Contact: Bev Stevens

Customer Support Specialists

Berkshire up to £7,000
Our client, a small but dynamic systems house, is expanding its Customer Support team to cope with the increase in business and is looking for experienced staff to work on real-time turnkey projects. Applicants should have a sound background in computing with at least two years' experience in the development and programming of special real-time turnkey systems using mini or micro-computers. Ability to take a project from initial order to final customer acceptance is essential. Additional experience in project management or training would be an asset. Salaries are negotiable and are not likely to be a limiting factor for candidates with the right experience and potential. Contact: Jim Baker

01-439 9311

PROGRAMMERS ARE YOU HUNGRY?

- * Earn up to £7,500 in the food industry!
- * A new IBM 4300 has been ordered for you!
- * New on-line systems to get your teeth into!

Based in Hertfordshire, our client is a leading international company in the food manufacturing industry. Right now they need programmers with at least 12 months' experience in COBOL to develop a range of new on-line systems which will serve the company into the 1980s. They also need experienced COBOL programmers with a good knowledge of one of the following — CICS/VS/VSAM/BAL to work closely with Systems Analysts on new applications. You can start on an IBM 370 under DOS/VS and get full training on IBM 4300 which is due later this year. The tremendous variety of existing applications and those planned for development will help satisfy your hunger. There are excellent career prospects with the department and you will add considerably to your present skills and get a high level of job satisfaction. There is a lively sports and social club and, in case you are still hungry — a subsidised restaurant. The company will also help with relocation costs where appropriate. For more information please call Barry Holden or write to him at

Castle Computer Services Limited
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Most software people think only 25% of the time.

Too many people in software companies spend too much of their time coding, not thinking about the overall system, not thinking about the user's needs, not thinking about the future.

Working on one of Europe's leading projects, you can have a better future. A good job, a good salary, a good future.

Indeed, we're so sure about the field that following precedent is as much use as following your nose in the field.

Our approach is to think and invent and think again, and then to think again, and then to think again, and then to think again.

If that's the way you like to work, you're natural for our environment, and for our new projects, our new projects, our new projects.

Apply to our client, perhaps.

Section Leader up to £8,000

You will be responsible for the overall working of systems that will be operational in 1980. You will be responsible for the overall working of systems that will be operational in 1980. You will be responsible for the overall working of systems that will be operational in 1980.

working for a right to question the status quo.

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Programmers up to £6,000

If you're a man or woman with at least a year's practical experience in Real-Time systems for scientific applications, and a good knowledge of a high level language or Assembly, you could step straight into an exciting role in our client's system.

If you want to work on an exciting project and a company where the rewards and the potential opportunities are in full measure, contact: Chris Hill, Marconi Avionics Limited, Elstree Way, Borehamwood, Herts WD6 1RZ. Telephone 01-953 2031 ext. 3449. Alternatively, telephone 01-207 2415 anytime (day or night) and we'll send you more information. Please quote reference MA 79140.

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COMPUTER AND SYSTEMS MANAGER FOR SYSTIME 5000 COMPUTER

We have just installed a Systime 5000 computer to handle our order processing and accounting functions. Considerable expansion is expected in later phases. The new Data Processing Manager will be the Company's only data processing specialist. He/she will have the following main responsibilities:

- Managing the implementation of the initial system.
 - Controlling the operation of the system on a day-to-day basis.
 - Preparing and implementing plans for system expansion.
- This is an excellent opportunity for a young data processing professional seeking to move into a management position. Candidates should have a minimum of three years' systems analysis and programming experience. They should also be able to show some experience of project management particularly in commercial and accounting systems. Knowledge of Basic Plus programming language is essential. For application form, contact:

Personnel Department
Whitman Ltd.
Springfield Mill
Walsley, Salford
Tel: (0522) 51551

UNIVERSITY OF LIVERPOOL COMPUTER LABORATORY

Applications are invited for two posts working with:

Microprocessors

in the rapidly expanding Microprocessor Unit.

Appointments will be made on the following basis:

Programmer/Analyst

£4333-£6355 per annum

Senior Programmer/Analyst

£5555-£7521 per annum

and initial grade and salary will be determined according to qualifications and relevant experience.

A degree in Digital Systems Electronics or Computer Science, is normally required.

Application forms and further particulars may be obtained from:

The Registrar, The University, P.O. Box 147, Liverpool L69 3GB.

The closing date for receipt of applications is 21st September, 1979, and it is essential to hold appointments by early October. Shortlist will be published in October.

Ref: R/785/CW.

HARTFORDSHIRE OF HAVILLAND COLLEGE Bretton Way, Boreham Wood Herts.

Would you like to join our team of Computing Lecturers?

If so, we have vacancies for full and part-time day lecturers in Computer Operating or Programming.

Please apply by letter or telephone to Mr. K. Staple, telephone 01-953 6024.

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Urgently required to trainee positions Industrial, scientific and Commercial situations.

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Are you good enough to work for LOLA?

Would you know how to deal with an I/O error on the SYSRES volume?
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Could you deal with JCL error correction on 'production jobs'?
Or deal with a JES2 'catastrophic error'?

If you can cope with problems like this LOLA have senior operating posts available which offer the challenge you are seeking. For the necessary skills we will pay up to

**£7,000 (inclusive of
3-shift allowance)**

LOLA (London On-Line Local Authorities) provides computer facilities to a consortium of four large London Boroughs and currently operates a S370/15BAP with 4 megabytes using MVS. On-line updating facilities are performed under IMS/VS supporting over 130 remote VDUs. A TSO and APL network is currently being set up and a mini-computer attached to the network is in operation.

If you like what you have read, have at least 18 months' IBM operating experience, and would like to know more about our organisation, then come along to an informal evening at LOLA on WEDNESDAY, 5 SEPTEMBER, AT 6.30 P.M. Light refreshments will be provided.

If you can't make this date then telephone Ext. 266 to talk to our Chief Operator, Peter Anthony, who would be happy to discuss your career prospects within LOLA.

YOU MAY NOT HAVE THE NECESSARY ATTRIBUTES AT THE MOMENT BUT LOLA OFFERS A COMPREHENSIVE TRAINING PATH AND CAREER STRUCTURE TO ENABLE YOU TO MEET YOUR FULL POTENTIAL.

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UNIVERSITY OF NOTTINGHAM DEPARTMENT OF ENGINEERING AND PRODUCTION MANAGEMENT PROGRAMMERS AND ERGONOMISTS

SAMEX is a novel computer aided design system based on a range of applications in the areas of engineering, robotics and production design. Further details are available.

1. A candidate qualified for software development and maintenance. Some experience of IBM/PL/1 and/or control systems would be desirable.

2. An experience in production or multiple design publishing in a computer with authority. The successful applicant will be expected to produce a range of reports.

SIC Interactive Computing facilities based on a PDP-11/40 will be used and a range of graphics will be available within the department.

Salary on a scale based on level from £3775 to £6100, depending on qualifications and experience.

Further particulars and application forms may be obtained from Staff Appointment Officer, University of Nottingham, University Park, Nottingham NG7 2RD.

UNIVERSITY OF ST. ANDREWS ADMINISTRATIVE & LIBRARY COMPUTER UNIT

ANALYST/ PROGRAMMER

(Grade 1A £4333-£7521)

Applications are invited for the post of Analyst/Programmer in the Administrative and Library Computer Unit which provides a computing service for the University Library and the Administrative departments. The equipment consists of a CIL 8060 running under E4/Advanced Operating Facility, the system is terminal based with interactive development and transaction processing. Work is currently in hand in the following areas:

1) Student records.

2) Normal ledger.

3) Library circulation control.

It is expected that the successful candidate will initially work on student records but could ultimately be involved in any or all of the project areas. Experience of this type of work would be an advantage. The successful candidate must have a minimum of three years' experience of COBOL and/or CIL equipment but the main requirement is for an intelligent, diligent person prepared to work hard without constant supervision.

Starting salary at appropriate point on scale £4333-£7521, depending on experience to age and experience, plus £550 O/S. Prospects of promotion to a higher grade in due course are good.

Applications (two copies) should be sent to the Staff Appointment Officer, University of St. Andrews, 100 North Street, Dundee DD1 1TA.

Ref: R/785/CW.

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MID GLAMORGAN COUNTY COUNCIL County Treasurer's Department

SENIOR SYSTEMS ANALYST (TECHNICAL PROJECT TEAM)

£5,721-£6,627 per annum

The Authority operates both ICL 2972 and 19045 computers and this post involves responsibility for the development of systems and the implementation of technical software for the Planning, Architect's and Highways Departments of the County Council. The team is also responsible for a large examination processing system developed on behalf of the Welsh Joint Education Committee.

A minimum of two years' systems experience preferably of a technical nature and a relevant degree or recognised qualification is essential.

Commencing salary will depend on qualifications and experience.

Benefits of working with the Authority include:

- * Located in centre of Cardiff with easy access to shops and parks.
- * Flexible working hours.
- * Experience of 29000 computers.
- * Contributory pension scheme.
- * The County Council's scheme for the payment of lodging and disturbance allowances will apply.
- * Subsidised canteen facilities.
- * National Conditions of Service.

Application forms (to be returned 14.9.79) are obtainable from the County Treasurer, Mid Glamorgan County Council, Council Hill, Cardiff.

CANVASSING WILL DISQUALIFY

TECHNICAL SUPPORT (Ref: 18A)

Would suit Senior Operator wishing to work days or Shift Leader with TP experience gained in-house or bureau. Extensive liaison with users. Salary £4000. Area: Burgess Hill. Contact KIM.

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Recruitment Consultants
33 Longwell Street, London E1 6JF
Tel. 01-688 9132/229

BECKMAN

INFORMATION SYSTEMS MANAGER

We are a large, U.S. based, multinational company successfully involved in the manufacture of high technology products for both Industrial, Biochemical and Clinical markets. A unique opportunity exists for a seasoned Data Processing Manager to assume responsibility for our entire European operation, based in the United Kingdom. Excellent salary, benefits package and relocation assistance.

Applicants must meet the following qualifications:

- Superior written and verbal communications skills. Ability to conduct business in French highly desirable.
- Proven record in large scale Data Processing Management: Business Systems and IBM-O.S., technical background.
- Availability for frequent European trips and occasional U.S. travel.

If you feel that you have the above qualifications and would like the challenge of a high level position, please submit brief career details including salary history to:

Miss Pauline Fisher
BECKMAN-RUC LIMITED
Tumpike Road, High Wycombe HP12 3NR, Bucks.
Tel. High Wycombe (0494) 41181

This appointment is open to men and women. Interviews will be held in the United Kingdom during October.

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2950, ICL 2903/4 or ICL 1900 operating under GEOS II, and be prepared to work on a five day shift basis. We're offering salaries ranging from £5050 for a senior operator to £5590 for a shift leader. In addition there is a first-class range of benefits, including 10 weeks' holiday, contributory pension and sickness scheme, plus car purchase discounts. Assistance with relocation will be provided where necessary.

Please write or phone for an application form to Mr. M. Rogers, Divisional Personnel Manager, Volvo Concessions Ltd., Lancaster Road, Crosses Industrial Estate, High Wycombe, Buckinghamshire, High Wycombe (0494) 33444.



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If you have or are looking for a challenging environment with real prospects for future advancement and feel you can handle the above challenge — Call Now! Consultant's Ref. EK 2062.

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Suit person with mini mainframe data exp. Smart presentation reqd. 3 shifts. Salary: £3,800 (under review)

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Merchant Bank needs experienced System 34 operator. Days only. 50p Lvs daily. 4 wks. hols. Medical scheme. Salary £5,000-£5,500 neg.

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ICL 1900/2970, Middx.

Operators 2 Senior Ops reqd. 8 months' / 2 years' experience reqd. with GII/III VME/B exp. advantage. Cheap trip — Salary £3,950-4 Ops. Up to £6,200 Bnr. Ops

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should be capable of planning and developing system projects with responsibility for teams of analysts and programmers. They will operate fully at the User level of middle management and will need to be able to communicate effectively from both a business and technical viewpoint.

Sound commercial systems expertise is essential together with a proven project record and the successful applicants can look forward to a progressive future with the opportunity to gain senior project management experience.

Our Client is an international market leader in its business area and offers the people appointed a progressive career prospect. The competitive commencing salaries are further enhanced by the package of large company benefits, and some opportunities exist for travel within Europe.

The

SYSTEMS ANALYSTS

will be responsible for the design and development of international projects. They will also liaise closely with senior project staff and User Management to ensure timely project development schedules.

Candidates who can offer a sound technical and business background will be able to utilise their experience to extend their own career development in an organisation committed to personal advancement.

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NCR Dundee is rapidly becoming established as an important centre of original software development for NCR worldwide. Current projects include a block-structured language compiler and control software for specialised self-service terminals—others are planned.

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If you are a graduate with up to 5 years experience in

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MARCOL'S ICL & IBM DIVISIONS are under pressure

Our clients are insisting on additional immediate assistance that outstrips our current permanent resources.

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The main area of interest will be for solid Cobol programmers, or analysts with a Cobol background to work on various applications including:

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We do not wish to waste your time, you will find us efficient, straightforward and

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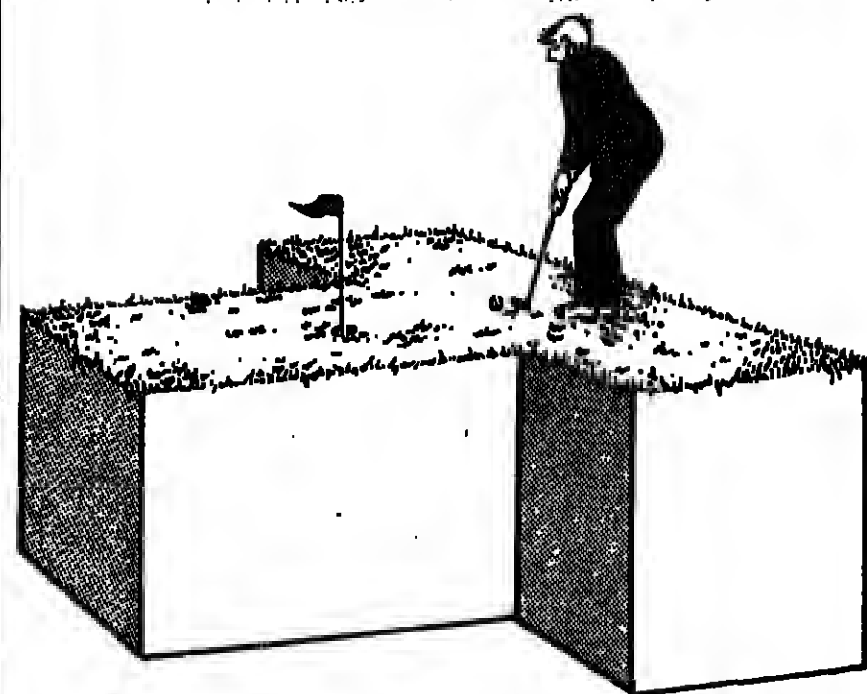
But you must be able to present a completely checkable career history to date.

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Interested? Contact Sue Hornsby, Personnel Officer, Tesco Stores Ltd., Delamars Road, Chesshunt, Herts, EN8 9SL. Telephone: Waltham Cross 32222.

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Planning Research Corporation is a \$250m international consultancy with interests in the commercial, industrial, Governmental and military fields. At present our Management Sciences group is undertaking a major expansion programme in the UK, Europe and the Middle East.

Our first projects are under way, and as a result we are setting up a major East Information System supporting, planning and budgeting for the total construction of two new cities in the Middle East. The system is based on IBM 370s in London and on site.

These projects have led to a need for a programming manager to oversee the design, installation and commissioning of the programs required. Ideally, applicants will be Analyst/Programmers with 5 years' experience — preferably with a minimum of 2 years' supervision of a team of programmers coupled with proven experience of systems analysis and design. A scientific or engineering background is desirable. Systems experience must include good knowledge of Fortran, OS/VS1 or VS2, and TSO (with experience of writing/designing CLISTs).

The appointment will be based in Central London but travel to the Middle East will be required as necessary.

The proposed salary will be c.£8500 but will not be a limiting factor for candidates who match our experience/qualifications profile exactly.

We are being assisted by Charles Barker-Coulthard who are conducting initial interviews.

Please write with full details, or telephone for an application form quoting reference 466/6 to Charles Barker-Coulthard Limited, 30 Farringdon Street, London EC4A 4EA. Tel: 01-236 0526.

prc

Planning Research Corporation International

COMPUTER WEEKLY DP Opportunities in Banking & Insurance

Special Feature September 6 Issue

The September 6 issue of Computer Weekly - Britain's largest circulated computer publication will contain a special feature outlining the career opportunities and employment prospects open to data processing personnel in banking and insurance.

The shortage of experienced DP personnel has been a major problem for employers during recent years and this is likely to remain the case for some time to come.

A career in banking and insurance offers considerable scope for experienced personnel. This feature, one of several covering a variety of subjects, is geared to create a greater awareness amongst readers of those key areas of opportunity and at the same time, provide advertisers with the additional impact features secure.

Computer Weekly is the natural choice for recruitment advertising and always has had the highest circulation of any journal in the computer industry. Current average circulation has now risen to well over 90,000 with almost 25,000 more personally requested copies than the nearest competitor.

The combination of this special editorial feature and Computer Weekly's large penetration amongst analysts, programmers and operations staff etc, provides a first class recruitment advertisement platform.

Recruitment advertisement rate is based on £12.00 per sec and copy instructions should be received by Monday September 3.

COMPUTER WEEKLY

THE INDUSTRY NEWSPAPER FOR THE DP PROFESSIONAL
Published by The Computer Press Limited, 100 Fleet Street, London EC4A 3DF
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Programmers, Analysts, Designers and Consultants with either COBOL, PL/I, Assembler or MARK IV experienced on IBM and other large Main-frames or 16 + 32 bit Mini-Computers are needed to join Informatics' project teams throughout the U.K. and Europe.

Informatics Inc. is one of the major U.S. Systems houses with a truly International activities base. In Europe and the U.K. Informatics has experienced an impressive expansion over the past 18 months to the point where it anticipates doubling its manpower resources within the next year.

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Currently we are seeking personnel with backgrounds in Commercial and Scientific applications. The former will normally involve T.P. and Data-base projects and the latter will be involved in Telecommunications, Real-time process-control and scientific applications.

Informatics will offer you well above top market salaries, International travel, first-class fringe benefits and invites you to attend an expense paid interview during the week commencing September 3rd. Phone Karen Whelan or Gordon Brown on 01-405 8546 (reverse charges accepted).

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With control being the key word, we are seeking to appoint a Manager to co-ordinate our computer resources. Heading a small team engaged on liaison between users and computer services, the successful applicant will be primarily responsible for accepting the integrity, feasibility and security of all new systems. This could involve technical considerations, manpower and machine availability as well as software and operations capabilities.

Although we are prepared to be flexible in our appreciation of individual talents, obviously, a sound data processing knowledge is essential. Perhaps the ideal background would be to have attained programming management status with good exposure to systems and operations functions. In all instances it will be essential to possess the ability to interpret technical jargon into terms easily understood by the layman user.

Adaptability is essential as you could act in a multitude of roles, perhaps as a Consultant, Planner, Watchdog, Training Officer and not least a line Manager. Obviously considerable emphasis must be placed on possessing the personality necessary for successful man/machine interface.

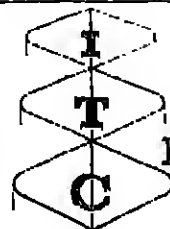
Excellent benefits are available including a generous relocation package. If you feel that you possess the attributes we are seeking, contact our Advising Consultant:

Martin Stainthorpe on: 021 236 3781 (24 hour answering service)
or: 021 744 1862 (evenings and weekends)

Interviews to be held in London, Birmingham and Manchester.

Specialist Computer Recruitment Ltd

London 01-635 0671 3 Mandeville Place, Wigmore Street, London W1M 6LB
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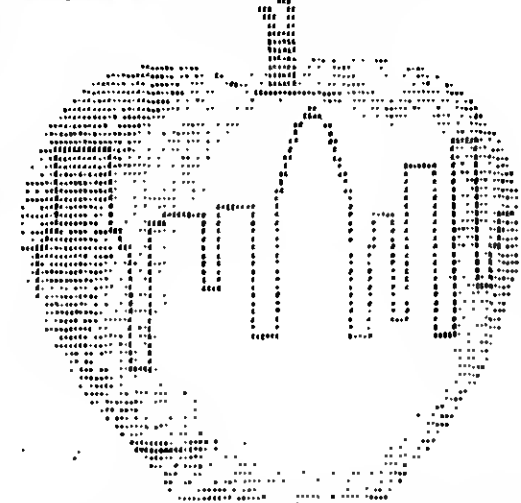
Applications are invited for a newly created post of Microprocessor Development Officer within the Computer Unit. The Officer will be responsible for the design and development of microprocessor based systems and will manage a team of staff working on a variety of projects. The successful candidate will have a degree in computer science or a related discipline and will have experience in the design and development of microprocessor based systems. The post is a full-time position and will involve a significant amount of travel. The salary is £10,000 per annum plus benefits. Applications should be sent to the College Secretary, Queen Elizabeth College, Campden Hill Road, London W8 5AH.

Salary from 1 October 1979 in range £3,804.18-£6,165 p.a. depending on qualifications and experience, plus London allowance of £500 p.a. Application form and further particulars from the College Secretary, Queen Elizabeth College, Campden Hill Road, London W8 5AH.

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Programmer required for industrial and scientific development.
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Our client, Computer Technicians Incorporated - Systems Division, a U.S. based consulting firm, is looking for Programmers and Systems Personnel to join a major U.S. bank, located in the Wall Street area of New York City.

Candidates for these permanent positions must have a knowledge of IBM and/or NCR systems. Vacancies exist for:

PROGRAMMER ANALYSTS
with a minimum of 3 years' experience.
SYSTEMS ANALYSTS/PROGRAMMERS
SENIOR SYSTEMS ANALYSTS

If you're tempted, simply telephone 01-937 8241 to arrange an interview, or apply in writing, with a full curriculum vitae to:

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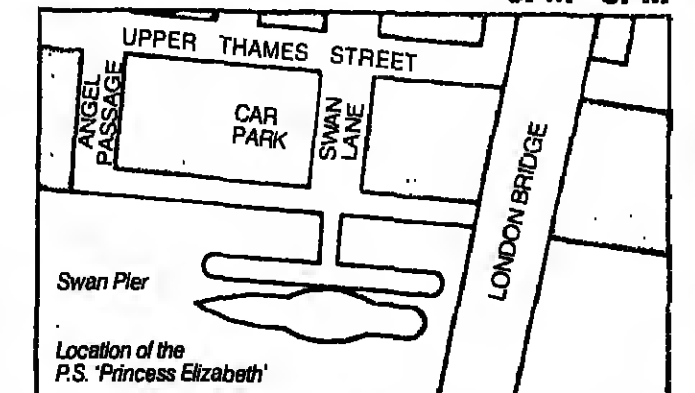
CMG's reputation in the City is second to none. We have been providing services to the financial sector for more than ten years and during that time we have grown to become one of the largest independent computer services companies in Western Europe. We feel confident that by the mid 80's we will be a £100 million business. Because of our excellent reputation we are committed to employing the best people and therefore, are prepared to pay the best salaries plus unrivalled benefits which include:

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To meet further expansion we are now looking for experienced DP Professionals with a firm knowledge of our business areas. If you have at least 2 years experience plus a background of programming and systems analysis we'd be delighted to meet you.

Informal interviews September 3

Paddle Steamer Princess Elizabeth,
Swan Pier, Swan Lane, London Bridge, EC4.
5PM - 8PM



(3 minutes walk from Monument Tube
and 5 minutes from Cannon St. B.R.)

If you can't come along please write or telephone, quoting ref C3, to:-

Chris Hennessy,
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The post requires a minimum of two years' experience in the O & M/Management Services field, in order to carry out a wide range of assignments. The anticipated starting salary will be up to £6848, within a career grade structure. Qualifications are desirable but aptitude and personality are qualities primarily sought. There are good prospects for advancement within the manpower services field.

For further details and application form, please write to Head of Borough Personnel and Secretarial Services, Town Hall, Mare Street E8 1EA, or telephone 01-986 9278 (24-hour answering service) quoting appropriate job reference. Returnable by 14 September.

An Equal Opportunity Employer.

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(In association with the Royal Marsden Hospital and the Institute of Cancer Research, Sutton, Surrey)

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The clinical and laboratory team engaged in a programme of research designed to study the biology of cancer, are seeking a research assistant to undertake programming and data processing of patient data and storage in PDP11 computer.

The appointment, which would extend for three years in the first instance, should be of interest to younger persons with sufficient training and personal experience in data processing, who are keen to apply themselves in a responsible and creative role.

Application, with particulars of education, training and previous experience, and with the names of two referees, should be made to the Secretary, London Institute for Cancer Research, 125-127 Avenue, Sutton, Surrey SM2 8PL.

CITY OF LONDON POLYTECHNIC TEMPORARY LECTURER II IN SYSTEM ANALYSIS AND DATA PROCESSING MANAGEMENT SCIENCE UNIT

Salary: £4,944-£7,523 including London Allowance plus a supplement of £8,000

A third person is sought to join a long-established team providing all Systems and D.P. teaching within the School of Business Studies of the Polytechnic.

The principal responsibility of the team's work is a new MSC/NCC 10-week Systems Analysis Course. The new recruit will be expected to provide a major input to this, as well as advising the team with respect to the design and delivery of professional courses of all types.

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£220-£260 p.w.

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Yusuf A. Alghanim & Sons KUWAIT

Our client is one of the most advanced commercial organisations in Kuwait. A multi-national company, they are one of the largest General Motor Dealers in the world and also have interests in Electronics, Construction and Travel.

The Management Information Services Group plays a major part in the continued development of the Company. We have been asked to recruit an experienced Manager to take charge of the Technical Services area of this group. This is a highly challenging position and the successful applicant will probably have a Degree and a minimum of two years management experience, backed up by seven or more years experience in data processing.

An extensive knowledge of IBM hardware and software products is essential and candidates must be thoroughly familiar with IBM operating systems, systems analysis and programming, and both high and low level languages. Good knowledge of telecommunications is essential. The successful candidate will provide a high level of technical support to the entire MIS group and will be extensively involved in evaluation, recommendation, acquisition and implementation of hardware and software, particularly in the data base and data communications areas. The position will involve the supervision of a small team of Technicians and liaison with senior management on configuration effectiveness, and work in progress.

The position carries an extremely attractive TAX FREE salary and a comprehensive benefits package including:

- * Furnished accommodation
- * Free transportation
- * 36 days annual leave
- * Free leave passage to country of origin for employee and family
- * Free health and life insurance schemes.

Please send a copy of your curriculum vitae to Michael Sarrick, or telephone him on 01-828 5356. Preference will be given to Arab Nationals applying for this position. Ref: 0107/CW.

John Goldsmith Computer Executives



John Goldsmith (Computer Recruitment) Ltd., Appleton House, Palace Street, London S.W.1. Telephone: 01-828 8386 - 24 hour answering service. Telex: 916770. Recruitment Consultants. A Company of the Personnel Plus Int'l Group.

Computer Operators

Up to £5,500 pa.

We require competent Operators to work on our installation of two 1904Ss and two 2960s, with numerous peripherals including on-line equipment.

To join these teams operating a shift system covering Monday to Saturday (34 hour, average four day week) you should be aged over 19 years, with a minimum of 1 year's experience on ICL 1900 series or some 2960 experience.

You can expect to earn up to £5,500, inclusive of shift allowance. Benefits include relocation expenses, house purchase scheme, four weeks' annual holiday, non-contributory pension, free life assurance, luncheon vouchers, 24 hour staff restaurant etc.

For further details and an application form telephone Rita Sidders on 01-952 2333, or write to her at:

Bankers' Automated Clearing Services Limited, 3 De Havilland Road, Edgware, Middlesex.



SYSTEMS ANALYST / PROGRAMMER I

Applications are invited for the position of Systems Analyst / Programmer. Candidates should have considerable experience of production control techniques and data bases, plus the ability to programme in COBOL.

Applicants should be educated to at least H.N.C. in relevant subjects.

Please apply to:

The Company Personnel Manager Telephone: Letchworth 6588

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Systems Analyst with knowledge of computerized telephone switching, traffic handling, call processing, etc. Experience in processor configuration and the ability to design software to meet the specification.

Working knowledge of PLM, SPL, and Assembler and of Intel 8080 series and/or PDP11 series hardware a distinct advantage.

This is an opportunity for the right applicant to join a team at the start of an important international project, and can represent long-term involvement and excellent job satisfaction.

Ref: GWK 190879

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A number of Programmer/Analysts are required with a minimum of 2 years practical experience in debugging real-time software.

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We are seeking computer professionals with this experience in one or more of the following areas of application:

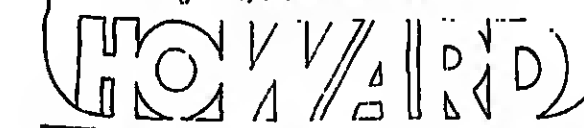
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NORTHERN REGION

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If you require personnel who command salaries of £10k and over take the opportunity of advertising in this special REGULAR FEATURE.

For further details contact: Mark Williams on 01-261 8028 or Mark Puiver on 01-261 8174

SOCIAL SCIENCE GRADUATES

Applications are invited from young social science graduates for a Scientific Officer post with the Social Science Research Council.

The successful candidate will work as part of a team providing the secretariat for the Computing Committee which is concerned with the support of software development and of social science research. Applicants will therefore need to be familiar with computing hardware and software. Knowledge of some relevant software would be an advantage but not necessarily at a detailed programming level.

The staff of the committee are not themselves engaged in research but provide support for the Committee which makes applications for grants to support research projects being undertaken in universities and independent institutions and which are involved with a variety of other matters relating to research in the field which they cover.

Applicants should normally be under 27, have a good honours degree and a genuine interest in research in this field.

Salary scale £4,009-£5,086 per annum including travel London weighting from 1 January 1980 £4,317-£5,395. Starting salary may be above the minimum depending on level of degree and experience. The hours of duty are 36 per week, including bank hours and the leave entitlement is 20 days plus 10% public and statutory holidays. The Council has its own non-contributory pension scheme.

Application forms and further details may be obtained from: Mrs. Anne Stewart (Ref. 01-261 8028), SOCIAL SCIENCE RESEARCH COUNCIL, 1 Finsbury Avenue, London EC2A 2BN. Telephone: 01-261 8028 Ext. 111. Closing date for applications: 13th September 1979.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE (University of London) Keppel Street, WC1E 7HT DEPARTMENT OF HUMAN NUTRITION COMPUTING ASSISTANT

A Pre-School Child Growth Survey requires a computing assistant, to work as a member of a small team up to 30 September 1981 on the handling of data from a large longitudinal survey, with responsibility for data checking and for maintaining data files in preparation for analysis.

Applicants should be qualified in computing to HNC level or equivalent, and have had experience in data processing.

The University of London Computer Centre COC 8800 system is used.

Good salary will be in the range (£1620-£1801 under review), depending on age and experience.

Applications, consisting of full educational and career details and naming two referees, should be sent to Secretary (A1) at the School.

CITY OF LONDON SENIOR TECHNICAL PROGRAMMERS Salaries up to £8,000

Lloyd's Register requires several technical programmers, at Senior and Junior levels, offering an interesting and demanding career.

A wide range of hardware is employed and includes Desktops, Minis and RJE Mainframes. FORTRAN, BASIC, APL and Assembler are used and training would be given where necessary. You would be encouraged to work closely with engineering staff to design and produce programs and systems for shipbuilding and offshore applications.

Please telephone 708 9168 ext 632 or write for an application form to: The Recruitment and Staff Relations Officer marking the envelope 'CONFIDENTIAL'.

LOYD'S REGISTER 71 Fenchurch Street London EC3A 8BB

Systems Support Engineer

Why settle for second best when you can work with the UK market leaders in engineering computer services? Due to an expansion of the Engineering Systems Group in London, our Clients, widely acknowledged as providing the best support service in CAD and engineering analysis, are seeking two Systems Support Engineers. The appointment will be in maintaining and developing software relating to our Clients' innovative products in the sphere of interactive frame analysis and finite element modelling languages. As part of a small but highly professional team, successful applicants can expect to use their technical expertise in the development and promotion of new applications, as well as providing a problem solving service within the engineering design field.

Candidates should offer fluent FORTRAN and 2-5 years experience in the design of engineering software or research into numerical methods. A degree in an engineering discipline plus a working knowledge of software applications on IBM and PDP11 machines would be advantageous. Rapid growth of operations both in England and on the Continent ensures scope for technical and managerial progression. Benefits include a bonus scheme, profit sharing, contributory pension scheme, LVs and an exciting working environment.

£8K

Kent to £7.5K

This large and exciting company requires Assembler or PLI Programmers at all levels of expertise to join their research and development teams. Benefits include flexible, subsidised restaurant and relocation expenses where applicable.

IMS (EEC)

Our Client is a dynamic and forward-thinking Software House based in the Netherlands, offering projects throughout the EEC. They are offering permanent positions for activated Systems Design and Applications Programmers. The experience required for these posts is at least 3 years IMS DB using DB1 and PL1 under OS/360; knowledge of structured programming techniques or other database systems such as SHAD/CW, TOTAL, ADABAS etc., would be advantageous. Project Leaders are also required for a large conversion being undertaken at a Real-time installation prior to the implementation of a new CMS releases. Working knowledge of French is essential.

Paris £10-16K

A major American company requires a CICS Systems Programmer for their Paris office. You must have Assembler, COBOL, and DLI and have been involved in the implementation of new CICS releases. Working knowledge of French is essential.

W. London-V.R.C.

This manufacturer is seeking Assembler and COBOL Programmers with a minimum of 9 months experience. Applications include invoicing, inventory control, management information etc. Excellent career prospects. £4.9-6.7K

£12-16K

Radar Systems-Europe

Senior Systems Designers and Senior Real-Time Programmers are required for a number of advanced projects in the defence sector. This large and exciting British Systems and Software Group is seeking additional technical specialists to supplement teams in its Dutch, Belgian and German offices. These projects are right at the forefront of technology, working on advanced defence systems in a stimulating development environment. Particular machine or language backgrounds are less important than a thorough grounding in the principles of Real-time systems, plus real-time implementation experience.

Radar data processing systems experience is of especial interest, particularly at the system design level. Our Client

also offers a wide variety of long-term opportunities as Consultants, Software Specialists and Managers in an expanding international group of companies with a reputation for project reliability and quality control. The company benefits are hard to beat including relocation expenses, life and health insurance, and optional company pension schemes. Furthermore, personal involvement (share purchase scheme) and challenging career prospects are offered. Early interviews will be held at our Client's offices and offers may be anticipated within two weeks.

£12-18K

Message Switching

Do you value working at the forefront of message switching technology? If so, our Clients, who are market leaders in their field, have authorised Matrix to initiate serious negotiation with a view to offering you a superlative career opportunity. Several positions have arisen within development teams based throughout S.E. England and the EEC. Matrix has been instructed to shortlist suitable candidates for the following posts: Project and Team Leaders, Systems Designers, Analysts and Programmers, both senior and junior. The hardware background is not particularly relevant but experience at the programming level calls for either Assembler, CORAL, RTL11, or BASIC. Relocation expenses will be met where applicable, and big company benefits are offered in keeping with our Clients' prestigious reputation.

UK-to £9.5K
EEC-to £15K



10 Grenville Place London SW7 4RW 01-373 3063

N.W. London

Our Client, a large user, is seeking Analysts and Programmers with 3-4 years programming/systems experience and a sound Real-time background to work on an advanced configuration PDP system under RSX 11. Promotion prospects are excellent and large company benefits apply. £6-7.5K

Fortran £7K

A leading Bureau with international connections is seeking Fortran programmers with at least 2 years experience to work in their Surrey offices. Knowledge of finite analysis, modelling and forecasting applications would be an advantage.

S/W Instructor

Graduates with at least 3 years in programming and design are required to undertake a wide variety of training activities in a high level environment with enviable facilities. Openings exist in London, Essex and Berks. £5.5-7.5K

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Contact: I. Gold Fraser Williams (London) Ltd. 38 Warren Street London, W1P 5PO Tel: 01-388 0036

K. Grimley Fraser Williams (Northern) Ltd. St. James House Vicar Lane Sheffield, S1 2EX Tel: 0742 28538

Fraser Williams Computer Consultants

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THE ROLE THAT GIVES REAL FULFILMENT TO ANALYSTS AND PROGRAMMERS IS IN CUSTOMER SUPPORT

- ★ Our client is a major world-wide Computer Services Group. Their rapid growth has created the need to expand their Customer Service Groups at several locations in the U.K.
- ★ The function of these groups is to produce custom-built solutions to individual business problems. The computer facilities available to customers are among the most sophisticated to be found anywhere. They are used by a very broad spectrum of companies across the world. This provides not only project variety in both size and complexity for customer services personnel, but also gives a first-class opportunity for career development.
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- ★ The opportunities exist in:
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- ★ In addition to competitive salaries, the company provides a comprehensive range of benefits and there are excellent training facilities.

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RECRUITMENT CONSULTANTS

If your earnings package is better than ours we'll come and join you!

We wish to expand our small professional company through the addition of a Recruitment Consultant who has a proven track record in the UK. We know there aren't many of you to recruit from: what we do believe is, if you are the person we are looking for, then we have a lot to offer you.

The success of our company depends on the quality of its people and our remuneration package reflects the desire to recruit and keep the best in the business. In addition to high financial rewards, we offer the kind of professional independence that will appeal to the successful, mature person.

If you are successful with us, your planned career progression will include a Directorship.

Ref. CW 35/3

Please call **DAVID J. HUTCHINSON** on **01-499 4501 (day)** or **01-643 3233 (evenings)** for a confidential discussion.

PROJECT MANAGER for a very SENIOR SALES SUPPORT ROLE

A new launch by this well-established multi-million dollar D.P. company has determined the creation of a new support group. Reporting to a U.K. Director, this senior person will head up a small dedicated team. The responsibilities of the post encompass all traditional pre-sales functions, applied to applications software, together with the development and implementation of the subsequent systems.

To gain a five-figure salary + car and enjoy outstanding career opportunities, candidates need a track record in project management and plenty of experience in submitting proposals for applications development.

Ref. CW. 35/2

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D.M.L. Computer Personnel Services, 11 Charlotte Square, Edinburgh EH2 4DR.

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CROYDON

Commencing salary including allowance, within the range £4,440 to £5,232 per annum, plus current satisfactory productivity payment.

Applications are invited for the position of Senior Computer Operator, experience of at least 2 years with IBM 360/370 hardware, running under OS/VS operating systems is desirable.

Our present installation comprises a 4.0 meg 3032 and a 2.0 meg 3031 IBM operating on a 3 x 8 hour shift/5 days a week basis. We undertake a wide variety of both batch and on-line applications and currently have about 550 VDU's installed throughout the Region.

Applicants should be prepared to work the shift system for which a 17% shift allowance will be paid.

For further information please Alan Hood on 01-486 9417 (playback) or 01-681 3248 (evenings) or write giving full details to the Personnel Manager, SDA's House, Fulham Street, Croydon.

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Anglian Water Authority PROGRAM ANALYST

Post No. R3R30. Grade 4 £4,170-£4,470 inc. supplement (Increase pending)

Applicants are invited from suitably qualified and experienced persons for the above post based at Boston with the Resource Planning section of the Divisional Engineers Department. Applicants are expected to have a good degree in computer sciences and post-graduate qualifications in computer technology or equivalent with relevant experience, together with several years' general experience in applied computer technology.

Duties will include the development and preparation of programs, systems and computer compatible data in connection with surface water and groundwater studies and models, engineering resources, and flood studies and models, engineering design studies and other studies and models concerned with chemical data, quality control and abstraction control. The Division at present operates two on-line computer terminals and a small in-house computer with a number of peripheral units. The successful applicant will have responsibility for the overall effective and efficient use of computer facilities and, in particular, will act as the Division's Liaison Officer in connection with the Authority's Honeywell system based at Huntingdon.

The collection of Hydrometric, scientific, engineering, chemical, operational control and abstraction data forms a major part of the Division's workload, both routine, and in a development sense. It is essential that such data is made available for effective and efficient use for management, engineering, scientific and administrative purposes. The post offers an interesting opportunity to widen and broaden experience in applied computer techniques and to gain specialist knowledge in connection with water management.

N.J.C. for Water Service Staffs conditions of service apply and reduction in salary is payable in appropriate cases. At present the post carries a casual user's car allowance and a review of salaries is under negotiation.

Application forms, which are returnable by Wednesday, 18th September, 1979, are available from the Divisional Manager.

George Ogden, Divisional Manager
LINCOLNSHIRE RIVER DIVISION
60 Wide Banquet, Boston, Lincolnshire
PE21 8SA

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The successful candidate will ideally have Computer Programming/Systems Analyst experience preferably, but not necessarily, in Wholesale and/or Retail chain operations.

Initially the work will involve visiting and working in various locations throughout the U.K. The successful candidate will be expected to reside near Warrminster, Wiltshire, and re-location expenses will be paid. A Contributory Pension Scheme is in operation.

Applicants are asked to write or telephone for an application form to

**Bernard Miller, F.C.A., Secretary
INDEPENDENT CHEMISTS MARKETING LIMITED
51 Boreham Road, Warrminster, Wills. BA12 9JD
Telephone: 0985 215555**

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We need a Senior System Test Engineer and a less experienced Test Engineer - both with the flair, imagination and skill to build, commission and operate "Test Bed" models, at New Southgate and other sites, if required.

Part of the responsibility will be for purchasing necessary component and loose end software services. The Senior Engineer will control a small team of hardware and software engineers. A number of exchange models will be involved.

All candidates, male or female, must have at least an HNC/HND, in Electronic Engineering, and at least 3 years' experience in Test Engineering on electronic or computer based systems. Candidates for the senior post should also have some staff supervisory background.

Salaries will be negotiated. There are other useful benefits. Location is on the North London/Herts border.

Please telephone or write for an application form, quoting ref. REB6, to Mrs. G. Layelle, Recruitment Department, Standard Telephones and Cables Limited, Oakleigh Road South, New Southgate, London N11 1HB. Tel: 01-368 1234 Ext. 2263.

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THE SALES AND MARKETING BIT

**A formal 'job spec'
is essential
for every salesman**

A READER wrote in the other day describing a situation in which salesmen all too often find themselves immersed.

My correspondent works for an equipment manufacturer and is a member of a selling team. He is a conscientious and hardworking salesman and whenever any of his clients telephone the office with a problem, he does whatever is necessary to make the caller happy. Unfortunately, when clients find it necessary to seek a solution to non-sales problems (if there is such a thing) then the level of enthusiasm from other departments is substantially lacking.

Such has been the reluctance of the various supporting departments to provide real customer service that this particular salesman's clients will no longer deal directly with the appropriate service but instead telephone him and demand that he sorts out the problem (like, "You do want to keep the business don't you?").

The result is obviously a severe loss of selling time and consequently a loss of commission earnings and a target performance which is less than it might be.

It is a pity that in this kind of situation, as far as I can see, it is all a function of what one is employed to do. While a salesman, above all people, needs to be very flexible in his attitudes and actions, he needs a point of reference so that when all else fails, he can make some kind of demarcation between his responsibilities and those of other people.

A salesman is employed to sell, but in his role of being the company to the client and the client to the company, he can become everybody's "whipping boy" when things go wrong. That is why it is essential for every salesman to have a formal job specification which precisely states his responsibilities, and if necessary his non-responsibilities.

Particularly in these days of the Employment Protection Act, any salesman operating without a job specification is a fool to himself. Assuming the salesman is armed with a formal statement of his role within the company, it should then simply be a matter of discussing the problem with his sales manager. After all, the sales manager must also have a direct effect on his performance too, and consequently on that of the company as a whole. Ultimately, the managing director will want to know where such problems emanate and what has to be done to sort them out.

On the other hand, if the company shows no interest in providing effective client support, then the salesman's action is to find a company that does.

Having said all that, it is a pity that many salesmen spend a lot of time around the office sorting out non-sales problems that many of them consciously or subconsciously prefer such activity to getting into the street and kicking in a few doors.

It is easy for a salesman to get himself deeply involved in a situation demanding considerable effort and time utilisation when it would be better for the company and himself to back off, handling a problem which is not directly a selling matter is often a very slippery slope and once you are involved, it is difficult to escape until you get to the bottom.

Sometimes the salesman's refusal to become involved can be to the client's detriment. If that happens too often, then there is something drastically wrong with the salesman's company and the remedy is in his own hands.

The old adage has to be observed: It's the salesman's employer who pays him, not the client, and liabilities must be taken into account.

So what I'm saying is that salesmen are employed to sell and that means the maximisation of the time which can be made available for this activity to take place. It is the amount of time which is ostensibly the province of other people's departments, then it is up to the salesman, no one else, to decide whether the fault lies within his conscious or subconscious self or whether it is a failing within his company - then act accordingly.

The existence of formal terms of reference make subsequent debate rather more rational than it might be otherwise.

TRADER

PRODUCT NOTE

Converter

BURR-BROWN has introduced a low-cost digital to analogue converter. The DA 71 is available for three types of digital input: TTL, ECL, and BCD.

Burr-Brown, International (CW), 17 Exchange Road, Watford, Tel: 0923 33637.

Puzzle Answer



The largest square plate that will fit inside the box has a side measurement of 11 1/2 inches. It must be placed with each corner one-quarter of a centimetre away from an adjacent wall.

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(18 months exp, C. London)

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Our clients are market leaders and in their specialised field are the most experienced organisation in the UK.

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CW35/1 MICHAEL

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CW35/2 MICHAEL

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NEWS IN BRIEF

STSC reports \$927,000 loss

A LOSS in Europe of \$927,000 on a turnover of only \$321,000 has been reported by APL specialist Scientific Time Sharing Corp. In the results for its 1979 fiscal year which ended on May 31.

The president of STSC in the US, Daniel Dyer, said that expansion in Europe had been more expensive than expected.

Good start

THE ICL 7700 word processor, which can be used as a stand-alone system but is primarily designed for use with ICL mainframes, has got off to a satisfactory start, with UK orders for about 40 worth over £800,000.

Repeat course

LOUGHBOROUGH University's five-day course on computer ergonomics for managers and designers is being repeated from September 24 to 28. Topics to be covered include the design of terminals, computer environment, user software interfaces, and documentation. Attendance for including accommodation is £240. Information from (0508) 61171, ext. 382.

Fairchild visit

SECREARY of State for Trade John Nott is to visit the Fairchild semiconductor facility in Mountain View, California, next month during a tour of Australia, New Zealand, Fiji and the US West Coast. He will also address the British American Chamber of Commerce in Los Angeles.

220% growth in personal systems in 1980

A UK MARKET for personal computer systems of some £272 million is being predicted for 1983 by the Commercial Intelligence Unit of ITC Consumer Electronics, the manufacturer of the ITC 2020 microcomputer system.

This figure, which does not include potential sales of single board kit systems, corresponds to the company's estimate of unit sales in that year, 250,000 systems, multiplied by their estimate of the average sales price, £1,090, for such equipment.

The research effort is part of the company's growing commitment to the 2020 system, which it is assembling under licence in this country from Apple in the US.

The predictions include some interesting estimates of the way ITC feels the market will develop. It sees little scope for a hobby market, and expects that the majority of sales will be to business establishments.

This year, it forecasts sales of 25,000 systems in the UK, with the big growth in the market coming in 1980. Then, it predicts a jump in unit sales of about 220%, to 80,000

systems. Growth in subsequent years will fall off slightly, with 1981 growing 8% over 1980, 1982 growing by 3% and 1983 showing a 25% growth.

ITC is also suggesting that Intel's memory could have a significant impact on microcomputer systems by the mid 1980s. It expects to see volume production of these devices by 1982, at a price that would produce memory systems price-competitive with current audio cassette equipment.

IBM ousts ICL in supermarket chain

AFTER wrestling Tesco from ICL last year, IBM is replacing ICL at another supermarket chain, Mac Markets, as the result of a merger last week between Mac Markets and International Stores, an IBM user.

International's parent, BAT Industries, owns 75% of the new merged supermarket group, and the plan is to centralise all computer operations over the next three years on to an IBM mainframe at a new installation at Bracknell.

NCR as well as ICL will lose out because the work from a Criterion 8450 at the Ruislip, Essex, headquarters of the Wallis supermarket chain, which was taken over by International two years ago, is also to be transferred to Bracknell.

At the moment the Mac Markets computer centre at Farnborough, Hants, operates an ICL 1903T which is being upgraded

Swanley, Kent and the workload from the 148 will be the first to be transferred to Bracknell. The Swanley centre will be closed down completely by the end of next year.

The IBM machine at Bracknell will initially be a 3031 which is expected to be installed there by the end of this year. A bigger IBM mainframe will almost certainly be needed by the time the centralisation process is complete.

ICL was also the victim of rationalisation of DP activities within the Grand Metropolitan Hotels group, whose DP division, Grandmet Information Processing, Grip, decided to

standardise on IBM equipment (CW, February 17, 1977). Grip was formed after Grandmet took over brewers Watney Mann.

Mergers and takeovers usually mean lost business for at least one computer company, but one announced last week, between the Newcastle Permanent and the St Andrews building societies leaves everybody happy. The Newcastle Permanent has a Burroughs B1830, recently upgraded from a B1714, while the St Andrews has a Burroughs L series visible record computer. At present there are no plans to merge the two computer operations.

Counter revolution

From front page.
 counter terminals in a big way.

Computer Weekly that there had to be an end to the vast quantities of paper which had to be transferred in the clearing operation (CW, May 27, 1978), and shortly afterwards started to experiment with Burroughs TD 700 terminals (CW, October 21, 1976).

The bank now has 200 Burroughs terminals in operation at cashier positions, but describes the systems as still experimental, adding only that magnetic stripe cards are not involved.

National Westminster has two experiments under way. At one of its Leicester branches, there is an IBM card reader terminal similar to the one used by Lloyds. However, in this experiment, the customer hands his card over to the cashier who

feeds it into the terminal, which means that a second magnetic stripe card is not issued to the customer, since the card used with NatWest's cash dispensers carries a secret number known only to the customer.

In the other experiment at Burroughs terminal linked to an automatic note dispenser is being tried out at cashier positions in the bank's Enfield branch.

Barclays plans to begin its first pilot experiment in six to eight months at a few branches, and will equip teller positions with a Fortronic terminal consisting of a numeric key-pad and small receipt printer. Barclays gave no further details of the terminal, but it is likely to be similar to the one Fortronic has been supplying to Clydesdale Bank in Scotland.

SEL founder kidnapped in Sardinia

CO-FOUNDER of SE Laboratories Rolf Schild and his wife and daughter were kidnapped last week while on holiday in Sardinia. Some days later their burnt-out car was found 80 miles away from their villa on the island's north coast, but as Computer Weekly went to press there was no firm news as to the family's fate.

On a telephone call was received from a group calling itself the Red Guerrillas and claiming to be holding the Schilds and demanding the release of Italian political prisoners.

The police were following up this call but thought that it was most likely a hoax. They warn still awaiting ransom demand.

The Italian Premier, a native of Sardinia who is on holiday on the island, is taking a close interest in the case and with the Interior Minister, Signor Rognoni, is reported to have taken personal charge of the police hunt.

Schild and his colleagues were co-founders of their own electronics company, SE Laboratories, in 1965 and about 10 years later this highly successful venture was acquired by EMI for over £2 million.

The two partners stayed on with EMI in various directorial capacities until 1973 when they left to become joint chief executives of the Huntingdon Group. This has since expanded under their control and now includes companies in the electronics, instrumentation and aviation fields. It also includes Micro Image Technology which specialises in ultra-pure chemicals used in the manufacture of semiconductors.

Gamma moves into mainframe systems

WITH the acquisition of a Manchester-based software house specialising in financial systems, Gamma Associates computer group has taken its first step to serving the mainframe market.

At the same time, the move is understood to be the first of several ventures planned by Gamma in the north west, a region which it sees as a second significant area only to London.

Fars Computer Services, in which Gamma has taken a majority stake, was formed two years ago. Its main efforts since then have gone into the development of two highly regarded financial software packages: fixed assets register and a financial planning system.

These will now be marketed by the renamed Gamma Ltd with the full support of Gamma.

The fixed asset system, FARS, is seen by both companies as catering comprehensively to assets management. Designed for interactive operation, it is written in Fortran IV and supported on equipment including IBM, ICL and ICI mainframes, the PDP 11, II, 2000, and Prime.

\$10m Cray

A CRAY 1 supercomputer worth \$10 million is to be installed at the Los Alamos Scientific Laboratory, New Mexico. But an order for a Cray 1 worth \$8.5 million from Sandia Laboratories of Livermore, California, has been postponed following complaints from unsuccessful bidders that the time of the request for tenders was improper. The laboratory is to go out to tender a second time.

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| TALLY T-1602 160 cps Bi-Directional printer with LA160 interface | £100.00 | £1650 |
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